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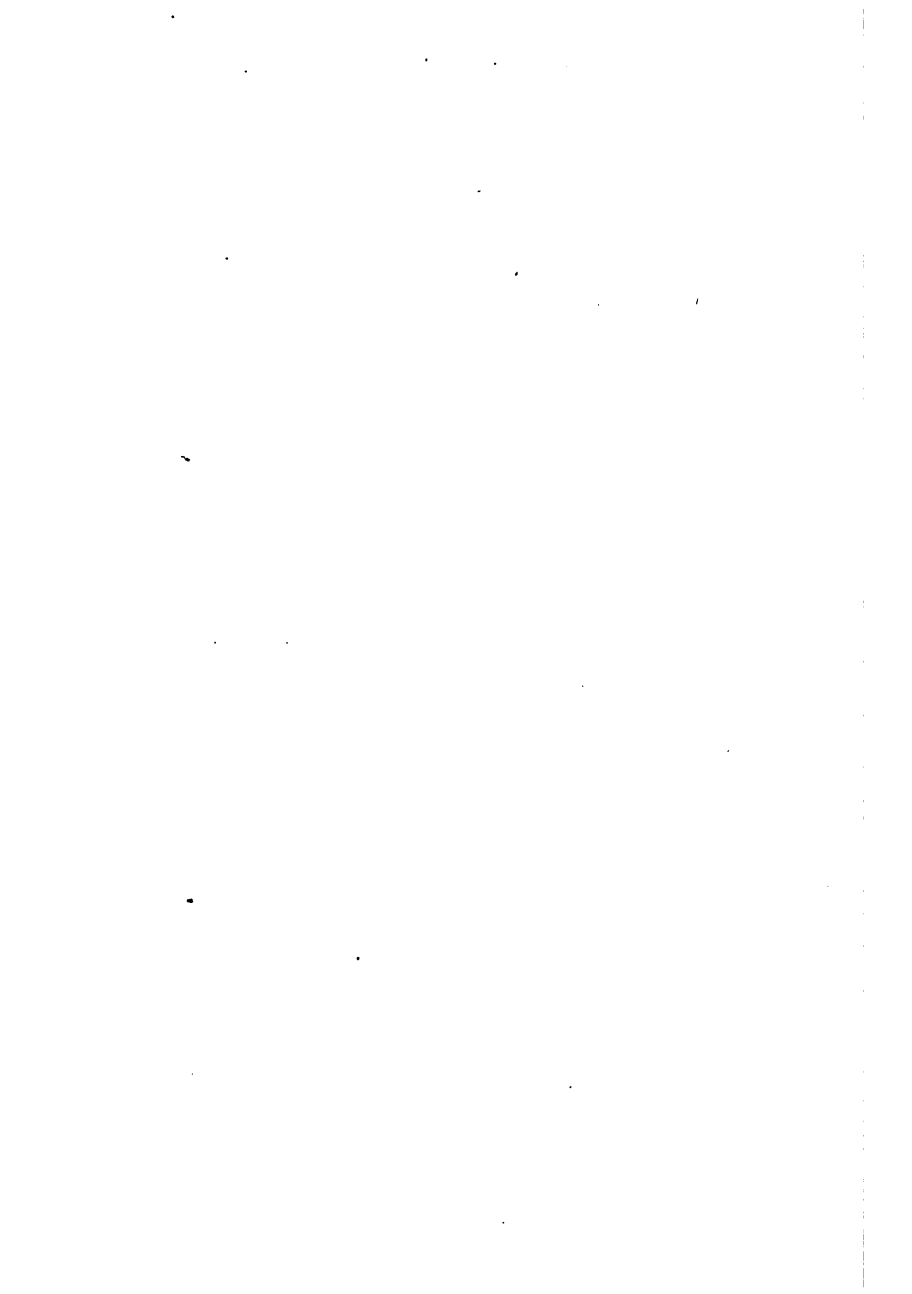
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# COMMERCIAL GEOGRAPHY

OF

## THE BRITISH ISLES

BY

A. J. HERBERTSON, M.A., PH.D.

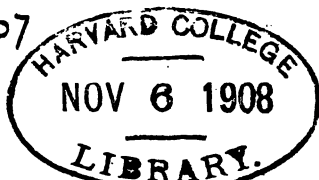
LECTURER IN REGIONAL GEOGRAPHY IN THE UNIVERSITY OF OXFORD, AND  
EXAMINER IN ECONOMIC GEOGRAPHY IN THE UNIVERSITY OF LONDON

SECOND EDITION



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## P R E F A C E.

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THE present book has grown out of the courses of lectures on Commercial Geography given by the author during the last three years in the Heriot-Watt College, Edinburgh. The chapter on trade-routes summarises a short course given in Manchester in connection with the Owens College and the Geographical Society.

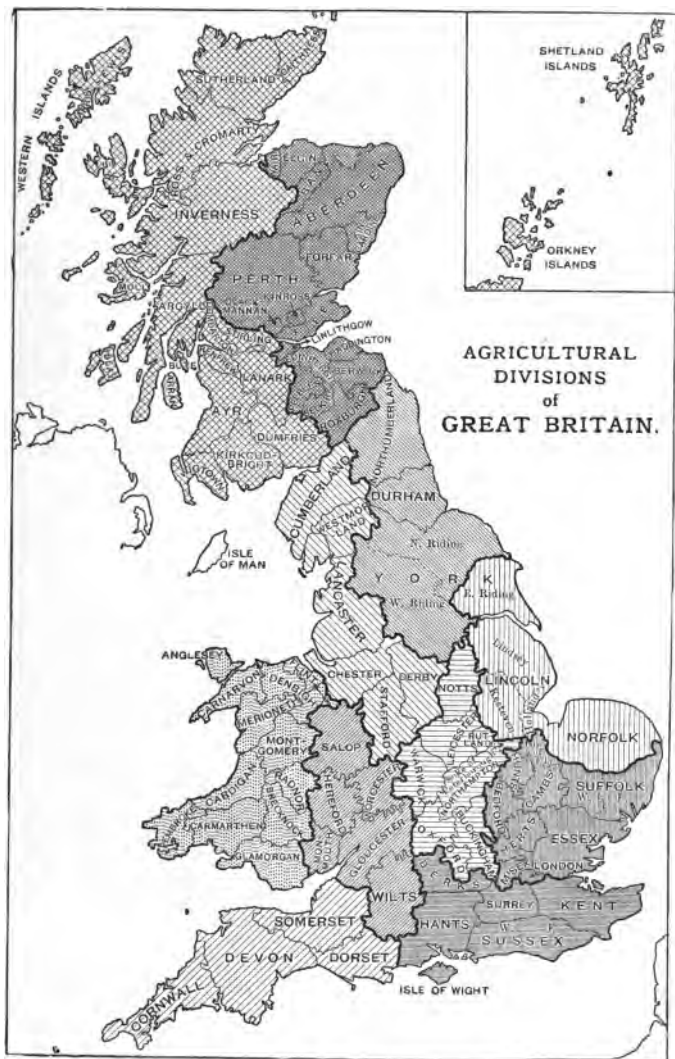
The book is intended for students and teachers of Commercial Geography who begin with the Commercial Geography of the British Isles. One word of warning is perhaps necessary. The whole of the details given are not intended to be learnt by heart. Figures are frequently quoted merely for purposes of comparison, to illustrate the relative importance of different branches of production and trade.

Commercial Geography cannot be understood without a grasp of geographical principles and their economic bearings. In this connection the perusal of Dr Keltie's suggestive little book on *Applied Geography* is recommended. The study of recent trade and consular reports in the light of geographical principles is an admirable exercise. The *Statesman's Year-Book*, or some similar statistical annual, the weekly *Board of Trade Journal*, and the admirable weekly commercial newspaper, *Sell's Commercial Intelligence*, should be in the hands of every teacher who desires to bring his information up to date. The *Shipping World Year-Book* is useful for information regarding ports and tariffs. Such works should constantly be placed in the hands of students, who should be encouraged in every possible way to deal with information at first hand.

In preparing this book free use has been made of the numerous articles in *Chambers's Encyclopædia*, to which teachers are referred for fuller information. Mr Chisholm's *Handbook of Commercial Geography* and his *Gazetteer* have also been used; while most of the statistics have been taken either from Government Reports or from the 1904 edition of the *Statesman's Year-Book*.

The statistics throughout the book have been brought up to date in this second edition.

OXFORD, March 1904.



# AGRICULTURAL DIVISIONS OF GREAT BRITAIN.

DIVISIONS.	AGRICULTURAL DIVISIONS AND SUBDIVISIONS.	Total Area of Land and Water.		Returned as under Woods and Plantations in 1895.		Estimated Area of Mountain and Heath Land used for Grazing.		Permanent Pasture.		Returned as Arable Land.	
		Acres.	%.	Acres.	%.	Acres.	%.	Acres.	%.	Acres.	%.
I.	(a.) Beds., Hants., Cambs., Suffolk, Essex, Herts., Middlesex, London. (b.) Norfolk, Lincoln, York, E.R.	8,647,000	3·2	118,000	3·2	35,000	9	956,000	26·2	2,084,000	55·7
II.	(a.) Kent, Surrey, Sussex, Berks, Hants. (b.) Notts, Leicester, Rutland, Northampton, Bucks, Oxford, Warwick.	3,882,000	11·3	489,000	11·3	127,000	3·2	1,869,000	35·2	1,413,000	36·3
III.	(a.) Salop, Worcester, Glou- cester, Wilts, Monmouth, Hantsford. (b.) Somerset, Dorset, Devon, Cornwall.	3,899,000	6·5	255,000	6·5	91,000	2·3	1,990,000	50·7	1,227,000	31·4
IV.	(a.) Northumberland, Durham, York, N.R., York, W.R. (b.) Cumberland, Westmor- land, Lancashire, Staf- ford, Cheshire, Derby.	5,072,000	3·9	202,000	3·9	1,025,000	20·1	2,092,000	41·2	1,122,000	22·1
V.	Wales (12 counties).....	4,774,000	3·8	182,000	3·8	618,000	12·9	2,277,000	48·1	1,016,000	21·5
VI.	Scotland (East).....	6,546,000	6·9	457,000	6·9	1,154,000	24·1	1,980,000	40·4	908,000	18·9
VII.	Scotland (West).....	12,909,000	8·2	421,000	8·2	2,177,000	38·2	519,000	7·9	2,170,000	38·1
	Great Britain.....	56,773,000	4·8	2,726,000	4·8	7,280,000	56·3	872,000	6·7	1,882,000	10·8
						12,820,000	22·2	16,513,000	29·0	16,007,000	28·1

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# COMMERCIAL GEOGRAPHY

## OF THE BRITISH ISLES.

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### INTRODUCTION.

**ECONOMIC**, or, as it is more often called, **Commercial Geography**, deals with the distribution of things of economic importance. It regards geography from the point of view of men's activities in getting food, shelter, and other material goods, and neglects all other aspects of the subject. The river Mersey, for instance, is of interest in Economic Geography, not because it rises in the Pennines and flows westward to the Irish Sea, but because its waters are available for turning machinery, for scouring, bleaching, and dyeing, and because its estuary forms one of the great waterways of the world. The Pennines themselves are important because of the grass on their sides, which feeds sheep, and because of the coal in their flanks, which is used as fuel in mills and houses, in the engines which convey freight between mills and markets, and in the steamers which sail from Liverpool and other neighbouring ports.

Economic geography, therefore, must take into account the geographical conditions which help man to make a living. The sea supplies fish and salt, and

is a pathway for his ships. The rivers supply water for domestic and industrial use, and, if navigable, afford an easy and cheap means of transport. The plains yield food for man and beast; the hills are pasture grounds; the very rocks yield stone for building purposes, clay for bricks, coal for fuel, iron and other metals for the necessary implements of manufacture and transport.

The occupations of men, therefore, have a natural distribution. On the coast they become fishers, sailors, or traders; on the plains, farmers; on the hills, shepherds; while mining and other industries depending upon coal and iron spring up where these sources of natural wealth are available.

Looking at a physical map of the British Isles, the south-east of Great Britain and the centre of Ireland are seen to be plains; the northern half of Great Britain and all the west and the corners of Ireland are generally mountainous, with plains of small extent. The south-east and east of Great Britain, therefore, are mainly agricultural, and the west mainly pastoral.

Agriculture is more developed in Ireland on the central plain than in the mountains to the north-west and south, but cattle-rearing is everywhere more important than the cultivation of the soil. This is largely due to the heavy rains, an illustration of the fact that climate as well as relief helps to determine the nature and distribution of occupations.

For many centuries minerals played a comparatively unimportant part in the economics of our island, except in the extreme south-west, where tin early attracted foreign traders to Cornwall. Salt was much in demand for preserving meat for the winter, and continued to

be so until the development of transport rendered the produce of distant markets available at all seasons of the year. At the dawn of history in Britain much of the land was uncleared forest, and hunting and fishing were the chief occupations. In Roman times the country must still have been densely wooded, for we find some of the main Roman roads leading over the bare mountain-tops, which were easier to cross than the wooded land below. In the regions that had been cleared of trees agriculture developed, and corn was exported to the Continent. Forest clearing, however, is a slow process, and for many centuries the chief product was wool from the numerous sheep which fed on the grassy slopes of the unwooded uplands. With the gradual clearing of the forests, agriculture became more and more important, but sheep-rearing remained the staple industry. The wool was not, however, manufactured at home, but was exported to Flanders. More than one English monarch attempted to introduce the woollen industry, and from time to time numbers of Flemish weavers settled in this country.

As the forests were gradually cut down and timber became scarcer, coal was increasingly used for fuel, and its consumption was enormously increased by the application of steam to machinery in the eighteenth century. The demand for machinery which sprang up at that time reacted on the iron industry, and led to the diversion of much land to industrial uses. Home production of raw material no longer sufficed for the rapid development of industry.

Meanwhile, although the population increased rapidly, the proportion of those engaged in raising food diminished, and the home food-supply became

quite inadequate. Foreign trade, therefore, had a twofold object—to dispose of the surplus commodities, and to supply the deficiency of raw material and food. Hence the paramount importance of trade, home and foreign, to our country, and the taunt sometimes levelled against us that we are a ‘nation of shopkeepers.’

In studying the economic geography of Britain, therefore, we have to consider the geographical conditions as they affect such primary occupations as fishing, the rearing of animals, or the tilling of the soil; to explain the reasons for the distribution of its industries and industrial cities; and to describe the great internal trade-routes, the great ports, and the commodities carried in the ships that enter and leave them.

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## CHAPTER I.

### PHYSICAL CONDITIONS OF BRITAIN.

**Mountains, Plains, Rivers, and Coasts.**—The physical features of the British Isles are of great economic importance. The high land of Great Britain lies in the west; the low land occupies the south-east and is nearest to the Continent of Europe. Ireland, farther removed from the Continent, is more or less isolated, and its east coast, which is nearest Great Britain, has few good harbours.

A line from the Exe to Whitby divides Great Britain into two parts—an older, hillier, northern and western part, and a younger, flatter, southern and

eastern part. The south-eastern plain reaches the west coast only at the Bristol Channel, and across the Cheshire plain to the Dee and the Mersey. These outlying portions of the plain separate the Cornish Heights from the Welsh Mountains, and the Welsh Mountains from the Pennine Uplands and the Mountains of Cumberland respectively. Farther north, the Central Lowlands of Scotland divide the higher ground into the Southern Uplands and the Highlands of Scotland, and permit communication from east to west. The long, narrow depression of Glenmore divides the South-east from the North-west Highlands.

Each of these regions of lower land, permitting ready communication from east to west of the island, is of great economic importance. In the case of England, the Bristol Channel serves as an outlet to the west through Bristol, Gloucester, Newport, Cardiff, and Swansea, corresponding to the estuary of the Thames, where London is the centre, on the east. Even more important is the flat Cheshire plain, which permits communication with the central plains of England. The Mersey estuary, with the great port of Liverpool, on the west coast, corresponds to that of the Humber, with Grimsby, Hull, and Goole, on the east coast. The Cheviot Hills and the Southern Uplands of Scotland practically shut off all communication between the two seas, and block the route to the north along the east coast, which is flat and easily traversed south of them. The great firths of the Forth and the Tay on the east, and of the Clyde on the west, stretch far into the heart of the Lowlands, and permit products to be easily received and distributed through Glasgow,

Greenock, and other west-coast ports, and through Leith, Grangemouth, Dundee, and other east-coast ports. This is the place to cut a great ship-canal across Great Britain, which would join the Clyde and the Forth, and prove of great commercial, as well as of great strategic, importance. The narrow depression of Glenmore is relatively unimportant from an economic point of view, as it is entirely in a mountainous region, and connects no great fertile plains or busy industrial districts.

From north to south the east coast is bounded by comparatively flat land, which is interrupted only by the Southern Uplands and the South-east Highlands approaching close to the sea, and by the Forth and the Tay, which necessitated long detours round their estuaries before these were bridged. Communication from the Thames almost to the very north of Great Britain has long been possible across the flat land along the east coast. The eastern barriers are not so formidable as those on the west coast, where communication was obstructed north of Lancashire by the Cumbrian Mountains, then by the Southern Uplands of Scotland, and lastly by the great extent of the Highlands. The lands around the Solway Firth could be reached only by the difficult route from the south between the Pennines and the Cumbrian Mountains, by the North Tyne from the east, or by the valleys of the Liddel, the Annan, and the Nith, which formed the equally difficult passes to the north. The valleys of the Tay and the Spey form passes across the centre of the South-east Highlands. The railways now traverse these, the easiest tracks across a difficult country.

The rocky, mountainous western coasts have many drowned valleys which form excellent harbours, but the lack of easy communication with the busy parts of the country makes most of these harbours comparatively unimportant, though Milford Haven forms a packet and naval station. The exceptions are where the estuaries are found in the western flat lands, and these are of the greatest importance now that the Atlantic Ocean has become a great highway for trading-ships. The chief are the Clyde, which reaches into the Lowlands of Scotland; the Mersey, which indents the Cheshire plain, across which the Weaver serves as a waterway; and the Bristol Channel, with the canalised Severn and the Warwickshire Avon communicating with the heart of England.

On the east coast, on the other hand, there are few good harbours except in the estuaries of the great tidal rivers and in the firths of eastern Scotland. The Tay and the Forth reach into the heart of the Scottish Lowlands. The Aberdeenshire Dee, the Tyne, and the Tees, though navigable only near their mouths, are outlets for important industrial regions. The Humber, the Wash, and the Thames are the most important in the south, and the chief waterways of the English plain reach the sea by them. The Humber is connected by the Yorkshire Ouse and the Trent with the flat lands of the north-east and centre of England. Parts of the Yorkshire Ouse and its tributaries, and almost the entire length of the Trent, have been rendered navigable by canalisation. The shallow Wash extends into the marshy Fenland, across which sluggish rivers like the Welland and the Great Ouse, now canalised, form waterways. The



Thames valley breaks through the line of chalk heights between the Marlborough and the Chiltern Hills, and serves as an outlet, not merely for the lowlands to the east of them, but also for those to the west. The canalising of the Thames and the Kennet has made them important waterways.

The south coast has many good harbours, such as Southampton Water and Portsmouth Harbour, but the line of chalk Downs which flanks it prevents ready communication with the interior, where the Kennet and the Thames form the natural route to the sea. The south-western harbours at Plymouth Sound and Falmouth Bay are excellent, but have little land behind them, while most of what there is is relatively unproductive upland.

Many of these physical hindrances to communication have been overcome by engineers in the last half-century, and now the railways follow not merely the lowlands that we have mentioned, but travel over the hills through passes like that of Shap, or tunnel through the oolitic and chalk scarps of central and southern England.

In Ireland the mountains lie, as a rule, round the coast, thus leaving a great central plain. This central plain is drained mainly by the Shannon, a navigable river expanding into great lakes, and forming a wide estuary, which, unfortunately for Ireland, opens to the west and not to the east. In the south, west, and north there are many good harbours, but they are in the more hilly regions, have relatively difficult communication with the interior, and do not face Great Britain. The southern and northern ports, however, are more favoured in this way than the

western, as the ports in the south communicate with the south-west of England and the Continent, and those in the north with the west of the Scottish Lowlands. The most important openings are Waterford and Cork Harbours in the south, and Lough Foyle in the north. The east coast has few good natural harbours, that of Belfast Lough being the best. Dublin, at the mouth of the Liffey, is on a gentle incurve of the coast, but Dublin Bay is not naturally a good harbour, and engineering works have been necessary to form the harbours at Dublin and Kingstown. Even now vessels of the largest size cannot get up to Dublin.

**Climate and Vegetation.**—‘All flesh is grass,’ says the Preacher, and all animals ultimately depend on plants for their subsistence. Plants alone have the power of obtaining food from the simpler elements found in the air, water, and soil. This they can do only in the light, and when there are sufficient heat and moisture. Their distribution thus depends on that of sunshine, heat, and moisture; in other words, on climate. The nature of the soil and drainage must also be taken into account, but where the climate is unfavourable good soil and drainage do not avail.

In spite of their situation in the northern part of the north hemisphere, between latitudes 50° and 60° N., the British Isles are specially favoured as regards climate. They lie to the north-west of the continent of Europe, and rise above the waters in the north-east of the Atlantic Ocean. Land near a great ocean has a more equable climate than that remote from the sea, and if the prevalent winds blow from the warmer parts of the ocean, as in the case of the British Isles, such a

country has an exceptionally equable and mild climate. Our land is therefore better suited to the growth of plants than most other lands in similar latitudes. The prevalent winds come from between south and west at all seasons of the year, and blow over stretches of warm Atlantic water. When they reach our shores they are heavily laden with moisture, most of which is visible in the form of clouds. The western mountains deflect the clouds upwards, leading to cooling and condensation. This makes them still denser, and causes heavy rains along the western coast and the west of the higher lands. On the other side of the mountains the air begins to descend again, becoming warmer and drier as it sinks once more to the sea-level. On the whole, therefore, the mountainous parts, more particularly their western slopes, are cloudy and rainy; the plains, more particularly in the east, are clear and dry. This has a very important effect on the nature of the plants grown, which in the west are species thriving best in dull, rainy conditions, and in the east those which require a relatively dry, clear climate.

In dull, wet regions plants run to leaf; their fruits mature more readily under drier and sunnier conditions.

From an economic point of view, the fundamental difference between west and east is that in the west those economic plants flourish whose leaves are of most use (and of these grass is by far the most important), and in the east cereals and fruits ripen well. The grass-lands of the country are found in the west and in the uplands, the grain and fruit regions in the plains, more particularly on the eastern side of the mountains.

Temperature, however, as well as humidity, must

be taken into account. For every additional 300 feet in altitude the temperature falls on an average  $1^{\circ}$  F.; for every additional degree of latitude it falls a little more than  $0.5^{\circ}$  F.; so that in the higher lands and in the north the conditions are less favourable for plant growth than in the plains and in the south. The temperature of winter is less important than that of summer, for grains and fruits require warm, sunny weather to ripen them, while many seeds and trees can withstand hard frosts. Moreover, many seeds are not sown until the winter is over.

The winter temperature of the British Isles varies little from north to south, but diminishes from west to east. Hence grass grows at all times of the year in the lower parts of the western section of the country, whereas in the east and in the higher lands the cold winters interrupt its growth.

The east is warmer in summer than the west, because it is less influenced by the cooling action of the sea, and the temperature is higher in the south than in the north; so that in summer the south-east is the warmest and the north-west is the coolest part of the British Isles. The dry, warm lands of the south-east are those that favour the ripening of the cereals. Above a certain height the summers are too cold for this to take place, even where the rainfall is suitable. Hence the highest parts of the British Isles are either bare or covered with poor grass, heather, or bracken; or, in the western parts, where the water accumulates in the hollows, great peat-bogs or mosses occur. In Scotland more than three-quarters of the land is unproductive, but in the south of Great Britain and in Ireland the proportion of waste land is less than a quarter. Thirty-

six per cent. of the United Kingdom is covered with permanent grass, and 26 per cent. grows cereals and other crops, including grasses under rotation.

**Soils.**—Soils are formed of decomposed rocks. They may be divided into clays, sands, and loams. Clays consist of very fine particles that are easily pressed together, and so do not let water pass through them easily. Sands are very different; their particles are larger and looser, and water easily percolates through them. Loam is a mixture of clay and sand in almost equal parts, and may contain more or less organic matter. The organic matter in soils is known as humus, and is of very great importance, its presence making soils fertile.

Lime is found in most soils in greater or smaller quantities, and is very useful when not too abundant. A very limy soil may contain as much as 20 per cent. A clay with a fairly large proportion of lime is called marl.

Soils depend in the first place on the nature of the rocks from which they are decomposed. Soils formed from immediately underlying rocks in the place where they are found are by no means the commonest in the British Isles. They occur mainly south of the Thames, where chalk and flints enter so largely into their composition that they are not very fertile. Many of the limy soils, like those of the Downs and the chalk and oolitic scarps, produce excellent grasses, which form food for many sheep.

Most of the soils of the British Isles are mixed, as the greater part of the archipelago has been covered by glacial drift. The ice, passing over many kinds of rocks, has ground up the waste of these together

to form boulder clay. There is a very noticeable difference in the fertility of the soils north and south of the Thames, the former being one of the richest agricultural soils in the British Isles, because of the mixing brought about by the ice in a region where very many different kinds of rock are found close together. The open clays which form good wheat-land are mixed soils.

Rivers, passing, as they do, through many different kinds of rock, bring down rock-waste of different composition and a large amount of vegetable débris. This makes the river alluvium, which is a very fertile soil, and much of the Fenland and the valleys of the Yorkshire Ouse and the lower Trent is formed of it. Alluvium occurs in the flood plains, and borders the estuaries of all great rivers.

There is considerable difference in the fertility of the soils derived from the older rocks. Many of the volcanic soils are fertile, but the hard crystalline rocks of the western mountains yield a comparatively poor soil. On the other hand, the Old Red Sandstone and many Carboniferous rocks yield fertile soils, but the limestone which covers so much of Ireland is not a specially favourable one for agriculture.

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## CHAPTER II.

### THE BIOLOGICAL CONDITIONS OF BRITAIN.

**Grass-lands.**—Where the elevation is over 1000 feet or the rainfall more than 40 inches a year, the land is almost entirely covered with grass, unless

special conditions of temperature or soil make it waste land. This grass-land includes all the mountain area of the western parts of the British Isles. In these districts, as a rule, the grass forms permanent pasture and is little broken up for cultivation, although here and there a patch of ground is sown with oats, and in Ireland considerable areas are planted with potatoes. In the other parts of the islands grass is found either as meadow-land or coming in rotation with other crops. Much of the cultivated grass is used for hay, but the proportion of this is less in Scotland, where the summer is cooler and more rainy than in other parts of the kingdom.

In Ireland 55 per cent. of the land is covered with permanent pasture, whereas in Great Britain the proportion of permanent pasture is less than 30 per cent. (Scotland, 7 per cent.; Wales, 40 per cent.; England, 40 per cent.).

**Cultivated Lands.**—The drier and lower lands in the east, more particularly of Great Britain, are cultivated. In Ireland 18 per cent. of land is arable, in Scotland 18 per cent., in Wales 19 per cent., and in England nearly 35 per cent.

Of this land the greater part is cultivated with a rotation of crops—cereals, roots, and grasses—of which cereals are the most important, except in Ireland and Scotland, where only 36 per cent. of the arable land produces cereals, compared with 40 per cent. in Wales and 50 per cent. in England. The principal cereal crop in the British Isles is oats. Two-fifths of the cereal-land of Great Britain and five-sixths of that of Ireland is sown with this grain. The oat flourishes in the cold, moist summer of the northern and western

parts of the kingdom, and the limit of its successful cultivation is fixed by the limit of early autumn frosts, which in the far north, or at a considerable height above the sea-level, kill the plant before the grain has matured. Only in England is less than half the cereal-land covered with oats.

Wheat is the most important English cereal, about three-tenths of the arable land being sown with it. One-quarter of the land producing cereals in Great Britain is sown with wheat, but only one-thirtieth of that of Ireland and of Scotland, and nearly two-fifteenths of that of Wales. Wheat requires a warm, dry summer, and the climate of south-east England and its rich soil are specially suited for raising heavy crops. Much of the wheat grown here is winter wheat—that is, wheat sown before winter; and although this is one of the colder regions of the British Isles, the wheat-plant is hardy enough to stand the winter temperature. Wheat-growing on an extensive scale is restricted to the south-east of England, not because the other parts of the kingdom are colder in winter, but because they are colder, wetter, and more cloudy in summer.

Barley, the most widely distributed of all grains grown by man, requires less sun than wheat, and many varieties have the advantage of ripening a week or two sooner after sowing than the oat, so that they can be reaped before the autumn frosts appear. More than a quarter of the land producing cereals in Great Britain, and about one-eighth of that in Ireland, is sown with barley. The wheat-growing area of England is also the region where most barley is produced. The barley of this region is exceptionally well suited for



brewing, and is cultivated for industrial rather than food purposes.

Little rye is cultivated in the British Isles, and that mainly as a green food, though some is allowed to ripen for its valuable straw.

Great changes have taken place in the last half-century in the cereal-producing areas of the British Isles, and in the nature of the crops sown. In Great Britain the cereal-land has been reduced by one-twelfth in twenty years, and in Ireland by one-fourth. Formerly half the cereal-land in England was sown with wheat and only one-fifth with oats, whereas now two-sevenths are wheat and one-third oats. In Great Britain over 40 per cent. of the cereal-land used to be wheat-land and 30 per cent. oat-land; now the figures are reversed. The proportion of barley has remained almost constant. In Ireland only  $3\frac{1}{2}$  per cent., instead of over 10 per cent., is wheat-land. The area of cultivated and permanent grass has grown correspondingly, having increased by 50 per cent. in Great Britain in twenty years. This is largely owing to the cheapness with which cereals can be imported from all parts of the world by the numerous quick steamer services which have grown so rapidly in the past half-century.

After cereals the green or root crops are the most important cultivated plants of the British Isles. The potato, introduced from America, and the turnip, grown as a field-crop since the end of the seventeenth century, are important food-stuffs. Potatoes, turnips, and mangolds are sown on an area about 18 per cent. of the arable lands in England, 12 per cent. in Wales, 17 per cent. in Scotland, and 28 per cent. in Ireland.

Potatoes flourish in the moister west, and are by far the most important crop grown in the west of Ireland. Sixty per cent. of the land producing root and green crops yields potatoes in Ireland, but only 18 per cent. in Great Britain. In the west of Great Britain the proportion of potatoes to cereals is also greater than in the east. East Lothian and Fife, in Scotland, however, are both noted for potatoes which are largely in demand in restaurants owing to the skins not breaking on reheating.

Turnips are of special importance in the sheep and cattle rearing regions, where the animals are fed on them in winter. They are abundantly cultivated in all counties of England outside the corn area. Over 10 per cent. of such counties as Norfolk, East Riding of Yorkshire, Berwickshire, and East Lothian is sown with turnips every year. The production of the man-gold is chiefly carried on in England, and the area is gradually increasing.

Of the industrial plants, flax and hops are the most important. Flax is grown extensively only in Ulster; about 4 per cent. of the arable land of this province is sown with it. The western counties of Donegal, Fermanagh, and Cavan produce much less than the eastern ones. A little is sown in one or two Scottish counties.

The production of hops is practically confined to the counties in the south of England—Kent, Surrey, Sussex, Hants, Hereford, and Worcester.

The cultivation of fruits on a considerable scale is confined to the south-east of England and the Severn Valley, but many small orchards and fruit-farms exist in favoured localities throughout the British Islands, especially in the east.

Market-gardens abound round the large cities, more particularly near London and in the Channel and Scilly Islands.

**Woods.**—5 per cent. of England and Scotland, 4 per cent. of Wales, and  $1\frac{1}{2}$  per cent. of Ireland is covered with forests. In England, Kent, Surrey, Sussex, Hants, and Monmouth are the only counties with more than 10 per cent. of their surface wooded; and in Scotland, Kincardine, Aberdeen, Elgin, and Nairn are the regions with the densest plantations—all these counties except Aberdeen having more than 10 per cent. of their surface wooded. It will be seen that the densest woods exist in the driest hill regions of the islands.

Deciduous trees, such as the oak, beech, elm, ash, alder, and maple, are commonest in the plains and fertile lands. In the northern and higher regions these give place to pine-trees. Many mixed woods of deciduous and coniferous trees exist, especially in the valleys of the mountainous regions.

**Useful Animals.\*—Cattle.**—The distribution of animals is largely determined by the distribution of grasslands. The rich meadow grass of Ireland and the western part of England is especially suitable for cattle. The proportion of cattle in Ireland is twenty-three to the hundred acres, and in England and Wales about fifteen, while in Scotland it is only six. In England and Wales cattle are most numerous in the counties of Cheshire, Leicester, Pembroke, Cornwall, Lancashire, Somerset, and Staffordshire. In all

\* Much of the information in this section is obtained from Dr Freame's admirable *Elements of Agriculture* (6th ed.; London, 1897).

the counties named there are over twenty cattle to the hundred acres. In Scotland, in no county are cattle so numerous. The majority are found in western counties like Renfrew and Wigtown, where the grass is rich and the winter mild, or in the Lothians, Fife, and Aberdeen, where they are fattened for the market. Galway is the only Irish county with less than fifteen cattle per hundred acres; while the counties of Limerick, Meath, and Dublin have over thirty cattle per hundred acres.

There are over a dozen native breeds of cattle in the British Isles. Of these by far the most important is the Shorthorn, which, originating in the Tees district of Durham at the end of last century, has spread all over the country, and is also widely distributed abroad. It is a breed noted for its beef and milk, and easily adapts itself to different climatic conditions.

Dairy cattle are found principally on the low lands, where rich meadow grass is obtainable. The Shorthorn, the Longhorn of the Midlands of England, the Red or East Anglian polled cows, those of South Devon and of Kerry in Ireland, are among the chief breeds; but, above all, the cows of Ayrshire, in Scotland, and of Jersey, Guernsey, and Alderney, are famous as milk producers.

The large cattle which are reared for their beef belong to the Shorthorn breed, found in all parts, or to the Hereford, Sussex, Welsh, Galloway, or Aberdeen breeds, whose distribution is indicated by their names.

Some breeds, such as the Shorthorn, the East Anglian, the Devon, the Welsh, and the Dexter Kerry, are reared both for meat and for milk.

The Highland cattle are a small but very hardy

breed, living on the poor pasture of the Scottish mountains, and, like the larger Galloways, yielding good beef.

Many of the cattle reared for the butcher are stalled, and feeding-stuffs of many kinds, some imported, are used.

Cows that are used for dairying have to be treated differently to cattle fattened for the market. To produce milk rich in fats, which are necessary both for butter and cheese making, a richer diet is essential, as cows that feed on poor pasture yield milk which is small in quantity and poor in quality. Dairy cows require much more careful attention than cattle reared for the butcher.

**Sheep.**—Broadly speaking, sheep are found chiefly in regions where cattle are few. They are commoner in the drier east than in the rainier west. They are found on the hillsides rather than on the plains. The chalk Downs of England and the Southern Uplands of Scotland are the best sheep-regions; but large numbers feed on the steep and easily-drained hillsides of the west, where they are reared principally for their mutton, whereas those on the eastern heights are bred largely for their wool as well as for their flesh. In England about fifty, in Wales over seventy, in Scotland thirty-eight, and in Ireland twenty sheep are found to the hundred acres. There are more sheep per hundred acres in Roxburgh, Selkirk, and Berwick than anywhere else in the kingdom. In Kent, Romney Marsh and the Downs are both suitable for sheep rearing, and one sheep is found to every acre. In all the counties through which the Downs extend the proportion of sheep is considerable. Cumberland, Westmor-

land, the limestone height counties, and most of the Welsh counties except Pembroke and Carmarthen have more than fifty sheep to the hundred acres. In Scotland all the southern counties, as well as the south-west of the Highlands, are noted for their sheep. In Ireland, Connaught and Leinster have more sheep than either Ulster or Munster; Carlow, Wicklow, and Galway being the counties which have over forty sheep per hundred acres.

The mountain sheep, such as the blackfaced and the Cheviot sheep of Scotland and the Welsh mountain sheep, are usually horned, and as a rule have rough fleeces, with thick, strong wool. They yield mutton of very fine quality. Except these, together with the Border Leicesters of the south of Scotland and the Roscommon breed of Ireland, all the other varieties of sheep are English. Of these, the most important are the long-woolled Cotswolds, Leicesters, and Lincolns, and the short-woolled sheep of the Downs and Shropshire. The pure Leicester is largely used for crossing with other sheep, especially those fattened for the market. The Southdown sheep, with fine short wool, has been used for crossing with, and thus improving the breed of many short-woolled sheep, some of which now form distinct varieties, like the Oxford Downs.

There are many varieties of sheep confined to limited regions, such as those of Romney Marsh, the Exmoor sheep, the Wensleydale, the Limestone breed of Westmorland, and others.

Horses are largely found in the drier parts of the British Isles, on less hilly ground than the sheep. In England, the three Ridings of Yorkshire, Norfolk, Cambridge, and Huntingdon have more than five

horses per hundred acres; and in Ireland, Down, Wexford, and Louth have the same number, and Dublin has double. In Scotland most horses are reared in Fife and Linlithgow; but the proportion is only about three per hundred acres.

There are two types of horses—the heavy work-horses, of which the Shire, the Clydesdale, and the Suffolk are the different breeds; and light horses, such as the thoroughbred, the hackney, the Yorkshire carriage-horse, and the small ponies which are found in the less accessible, less fertile, and more rugged parts of the island, such as the Shetland Islands, the Highlands of Scotland, the Welsh mountains, Dartmoor and Exmoor, and the New Forest. The Yorkshire coach-horse is bred in the north-eastern counties, more particularly in the North and East Ridings of Yorkshire itself. The hunter and thoroughbred are reared in different parts of England and in Ireland. The hackney or nag is reared chiefly in the eastern counties, more particularly in Norfolk, Cambridge, Huntingdon, Lincoln, and Yorkshire. The Shire is the largest work-horse, and is reared mainly in and around the Fenlands. The slightly smaller and more graceful Clydesdale is bred in the region which gives it its name. The Suffolk horse is still smaller in size, but is long-lived and a good worker.

**Figs.**—The proportion of pigs to cattle is greatest in the south-east of Ireland and England; but the largest number per acre is found in such eastern counties as Suffolk, Essex, Middlesex, Bedford, Cambridge, Huntingdon, and such western ones as Flint, Cheshire, Anglesey, Somerset, Dorset, and Cornwall. The total number in England is over five, and in

Wales under five, per hundred acres. In Scotland, most pigs are reared in Clackmannan, Wigtown, and Midlothian; but they are comparatively few. On the other hand, in Ireland most counties rear more than six pigs per hundred acres; the proportion being least in Connaught and greatest in Wexford.

Most pigs in Britain are white in colour, and are distinguished as Large, Middle, or Small White breeds. There are two black breeds, known as the Small Black of Suffolk and Essex and the Berkshire breed; while the Tamworth sow, originating in Staffordshire, is red.

The Large White sows yield a great proportion of lean meat and can be grown to enormous weights, whereas the Small White sow usually makes very fat bacon.

**The British Farmer and his Competitors.**—In spite of the large quantities of farm produce of every kind grown in the British Isles, the supply is wholly inadequate to the consumption of the country, and cereals, vegetables, meat, and dairy produce of all kinds are imported in ever-growing quantities. While the yield of English wheat crops per acre is higher than that of any other country in the world, except that of the small wheat-producing area of Scotland, the British farmer has found it difficult to compete with the settler who has cultivated the virgin lands of America or the rich black soil of Central and Southern Russia. He labours under the disadvantage of cultivating a soil which requires heavy manuring and careful tillage to produce good crops, while the high rent paid for land and the cost of transport by rail more than counterbalance the advantages due to the proximity of his markets. Rent and freight charges



will undoubtedly be reduced; but even then the British farmer will find the best guarantee for success in even more skilled farming than that for which he is already famous. Agriculture involves great scientific knowledge as well as practical skill; and in the matter of agricultural education our country has been comparatively backward compared with the United States, Denmark, and some of our colonies. With a more careful and intensive use of the natural agents of the country, the quantity and quality of pastoral and agricultural products may be still further improved; and in the future agriculture will probably become much more important than it is even at the present day.

**Fisheries.**—Fishing is a great source of food-supply. In this country fresh-water fish are comparatively unimportant. The salmon and sea-trout, which migrate between salt and fresh water, are caught in the rivers, mainly in the estuaries of Scotland, western England, and Ireland, more particularly in the Spey, Tay, Tweed, Severn, Bann, and Shannon.

The sea fisheries are exceedingly valuable. The turbot, sole, flounder, and other flat fish; the cod, haddock, herring, mackerel, and pilchard, are the most important fish caught. The waters over the shallow banks of the North Sea, and round the islands in the north and west of Britain, are visited by fishermen from many ports. From every little fishing village men fish with hand-lines, catch shellfish in traps, and go out in fishing-boats to the adjacent fishing-ground, where both lines and nets are used. The great centres of population are supplied with fish from the fishing-ports, which send out fleets of sailing and steam trawlers and other fishing-vessels, some of which have

tanks where fish can be kept alive until the ship returns to port. The fish may be sent from the fishing-grounds in swift carrier steamers direct to London or to the nearest port, whence they are despatched by special fast trains to the great cities. The east coast fisheries are the most valuable, and three-quarters of the fish are landed in England at east coast ports.

Fish are caught by hooks or in nets, which are either fixed or hauled. Short lines, whose hooks are rebaited after each fish is caught, are used close to the shore all round the coast. The east and south coast fishermen send out very long lines (some even eight miles in length, in eastern England), to which hundreds of baited hooks are attached. These are sunk across the current to let the short lines, to which the hooks are attached, float clear of the long one. When hauled in, haddock (in Scotland), cod (in the east of England), cod, ling, conger, skate (in the south of England), and many other predaceous fish are caught. The Scottish fishermen use mussels for bait, those in southern England squids or cuttlefish.

Where the bottom is smooth a trawl is used. It consists of a netted bag, with finer meshes near its end, the mouth of which is fixed to a beam raised a little above the bottom. This is hauled along, and brings up flat-fish such as flounders, soles, plaice, halibut, turbot, and others, together with fish that feed at the bottom of the sea, like cod, haddock, hake, and ling. The trawls are sometimes carried by large sailing-vessels, but oftener by steamers. From Aberdeen, Leith, and Granton, trawlers go eastwards to the banks in the North Sea. In eastern England, Hull, Grimsby, Yarmouth, Lowestoft, and Ramsgate send

trawlers to the Dogger Bank in winter and to the east of the North Sea in summer, whence the fish are sent to these ports or to London by fast steamers. On the south coast, Brixham and Plymouth are the chief trawling stations, the boats going as far in summer as the north coasts of Cornwall, where east coast boats also come. In the Irish Sea, Cardiff tugs often trawl off Lundy Island, and regular trawlers leave the Lancashire ports of Liverpool, Southport, Blackpool, and Fleetwood, especially for the seas round the Isle of Man, to which Whitehaven and Dublin send trawlers, as well as Douglas.

Migratory fish, such as the herring, mackerel, and pilchard, are caught in nets. Drift-nets are sunk across a current, and the heads of the fish are entangled in the meshes, which vary in size according to that of the fish to be caught. The herring is much the most important. It is caught chiefly off the Scottish coast in the west early in the year; in the north in summer; farther and farther south, along the east coast of Britain, as the year advances; and in the English Channel in winter. The ports of the Clyde sea-area, Strome Ferry, Stornoway, Lerwick, Wick, Fraserburgh, Peterhead, Aberdeen, and the Forth ports are the chief Scottish centres of the herring-fishing; and the north-east of England ports, especially Whitby, and Yarmouth farther south, are the chief English centres. Off the south coasts of England and Ireland mackerel-fishing is very important. Pilchard-fishing is confined to the south-west of England. The pilchards are caught in nets, which are let down across a bay such as that of St Ives in Cornwall, and hauled to land by ropes. Sometimes so many fish are trapped

that a number of smaller nets have to be used inside the barrier formed by the big one, which would break with the pressure of the fish were it drawn ashore.

Many 'shellfish,' such as lobsters, crabs, shrimps, and other crustaceans, are caught in traps or netted, and oysters and other molluscs are dredged.

About 45,000 men are engaged in fishing in Scotland, 30,000 in England, and 28,000 in Ireland; but the value of the English is two and a half times that of the Scottish fisheries, and twenty times that of Ireland, mainly owing to the nearness of large markets. In Scotland more than ten men, and in Ireland about six men, in every thousand are fishermen. In England and Wales the proportion is under one man per thousand.

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### CHAPTER III.

#### DISTRIBUTION OF MINERALS AND MINING CENTRES.

THE mineral wealth of the British Isles is mainly in the older rocks of the west and north. In the newer rocks of the south-east, clay (for making bricks), lime, and chalk are the most important mineral products.

The older rocks yield valuable minerals, and most of the sandstones and limestones can be used for building purposes.

**Building Materials.**—Of the building stones, the most important are the sandstones of Carboniferous and Permian times; but the oolitic limestones are also used for building purposes. The granite rocks of Aberdeenshire, Galloway, and Galway are quarried for stones

suitable for massive structures, such as bridges and reservoirs, where great strength is required, and for ornamental stones to be used in public buildings. Marble is quarried in Ireland.

Carboniferous limestones, as well as those of more recent date, are burned to yield lime, which is used as mortar or as a purifier or a fertiliser. Portland stone is ground to form an exceptionally quick-setting mortar known by the name of Portland cement.

In many parts of the older regions of the British Isles local stone is used for building purposes, whereas in the south-east of Great Britain nearly all the houses are built of brick. The hard old red sandstones of Caithness can be cut into large, flat, thin slabs which form excellent pavement.

Slates for roofing purposes are formed of rocks which are easily split into thin layers. These are usually clays which have been subjected to great heat and pressure. Purple slates are found in Wales, more particularly round Llanberis and Festiniog. The green slates of Tilberthwaite in Cumberland are the most beautiful of all; and different blue, gray, and purple slates are found in various parts of Scotland, more particularly in Perthshire and Argyllshire (at Easdale and Ballachulish), and in Ireland (in Cork and Tipperary).

Some Carboniferous rocks are useful for making fireclay, more particularly those of 'The Potteries' in North Staffordshire, those round Kilmarnock in Ayrshire, and those in Tyrone. Fine pottery is made in 'The Potteries' and in Worcester, whither kaolin or china-clay, a decomposed granite suitable for making the finest porcelain, is taken from the Cornish peninsula.

**Coal.**—Coal is the chief mineral mined in the British Isles. Iron and coal are two of the great sources of our industrial prosperity. 'The rich underground kingdom of the English and Scottish coalfields has often been called the Black Indies.' As coal is used in reducing the ores of the useful metals, especially iron, we shall study its distribution first.

Coal is found in the Carboniferous rocks, and therefore in the west and centre of Great Britain. The coal has been preserved in the rocks which form the trough of the Scottish Lowlands. In England the coal-measures covered the whole of the Pennine heights; but, though they are still found on both flanks, they have been worn away from the summits. They are also found where the Carboniferous rocks bend down on the eastern and south-eastern sides of the Welsh Highlands. In Ireland, which was formerly entirely covered by coal-measures, only a few isolated patches of coal now remain.

Coal-mining is carried on in Ireland at Castlecomer in Kilkenny, and at Dungannon in Tyrone, but is not important. The chief fields in Great Britain are the Scottish coalfield, divided into the western or Ayrshire coalfield, the central coalfield in Lanark, Linlithgow, and Stirling, with an outlier in Clackmannan north of the Forth, and the smaller fields of Fife and Midlothian; the Northumberland and Durham to the north-east, the Cumberland to the north-west, the Yorkshire, Derbyshire, and Nottinghamshire to the south-east, the South Lancashire and the North Staffordshire to the south-west, of the Pennines; the North Wales, the Shropshire and Worcestershire, the Forest of Dean, and the South Wales coalfields on the borders of the

Welsh mountains; the Midland in South Staffordshire, Warwickshire, and the borders of Leicestershire and Derbyshire, and the Bristol, both surrounded by young rocks.

(Those in large type are the most important.)

Coal is usually mined; but in a few places it is simply quarried. Its value has long been known. There is evidence that it was quarried even in Roman times. Sea-coal was sent to London from Newcastle from the thirteenth century onwards. With the clearing of the country and the growing scarcity of timber, the use of charcoal for iron-smelting became too expensive, and in the eighteenth century coal came into general use for this purpose. This gave a great impetus to the extraction of coal. New mines were opened and carried deeper and deeper to meet the ever-increasing demand due to the application of steam-power to machinery. The output has steadily increased, and was never greater than at the present time, when over 227,000,000 tons are raised yearly. The Yorkshire, Derbyshire, and Nottinghamshire field is the richest, yielding 52,000,000 tons. The Northumberland and Durham field puts out 46,500,000 tons. The South Wales coalfield produced over 39,000,000 tons in 1902, the Scottish coalfields 34,000,000 tons, the Lancashire coalfield 24,500,000 tons, the two Staffordshire coalfields 13,500,000 tons, and the others put together 17,500,000 tons.

The quality varies considerably in the different coalfields. In most it is a soft black coal, producing considerable heat and smoke. The cannel coal of central Scotland was formerly almost exclusively used for making gas, but it is now almost exhausted.

Anthracite from the South Wales coalfield supplies the smokeless coal for our navy, and is the fuel used in breweries.

The coal yielded in the various coalfields is put to very different uses.

In Scotland it is used in the iron and textile manufactories, more particularly in the west, as well as in Fife and southern Scotland. Much is exported from the Forth to the North and the Baltic Seas, to the Mediterranean, and even farther; from the west,



Scottish Coalfields.

chiefly to Belfast and the North of Ireland. The latter region also receives the surplus coal from the Cumberland coalfield, much of whose output, however, is used in smelting iron ores in Furness.

The output of the Northumberland and Durham coalfield is largely used in the iron industry. The surplus is exported, large quantities being shipped to London and all over the world.

The York, Derby, and Nottingham coalfield supplies the woollen manufactories of the West Riding of Yorkshire, the ironworks of Sheffield, and the textile



works of Nottingham. Any surplus is exported to London by rail, or from Goole on the Humber.

The coal of the South Lancashire coalfield is almost entirely used in the local cotton manufactories and



English Coalfields.

engineering and chemical works. It also supplies fuel for steamers sailing from Manchester and Liverpool. Hardly any is available for export.

The North Staffordshire coalfield supplies steam-power in the pottery district.

The Midland coalfield supplies fuel for the Black Country in South Staffordshire, the great centre of the iron manufacture. Large quantities are sent by rail to London.\*

The North Wales coal is used locally and in the salt and chemical works of Cheshire.

The Shropshire-Worcestershire coalfield, stretching between Coalbrookdale and Bewdley, supplies the ironworking region of South Staffordshire to the east, the Worcester potteries to the south, and the woollen manufactures at Kidderminster.

The Forest of Dean coalfield provides the coal needed in the local iron smelting and forging.

The Bristol coalfield supplies that city and the West of England woollen manufacturing centres.

South Wales coal is shipped to all parts of the world. Some is used in the district for smelting different ores. Many of these are imported, copper being brought even from distant Chile and red hematite from Spain, as it is less difficult to carry the ores to the coal than the coal to the ores. Anthracite

\* 'Of the coal-basins in Great Britain, the Midland coalfields are the least favourably placed for foreign trade. The Scottish basin is encircled and penetrated by the sea. The estuary of the Clyde on one side and the Firth of Forth on the other open it up by their long fjords, and form, as it were, large natural canals. The Durham and Northumberland coalfield stretches in the direction of a coast-line with numerous and excellent ports, among which it will be sufficient to mention Newcastle and Sunderland. The Welsh coalfield is provided for by the long estuary of the Bristol Channel. In the presence of three rivals so well equipped for exportation, the Midland coalfields are quite naturally designed to carry on the home trade.'—Quoted, with slight modification, from *The Labour Question in Britain*, by Paul de Rousiers. Translated by F. L. D. Herbertson. Page 165. London, 1896.

is sent to the great brewing centres, to vessels in the British navy, and to all our naval coaling stations.

**Iron.**—Iron is by far the most important of the metals obtained in the British Isles. It is found in several forms. In the more recent rocks, pouches of iron exist here and there, and used to be worked before the discovery of the richer deposits in the older rocks. They occurred mainly in the chalk rocks, and the timber of the wooded Weald was used for smelting them. The finest British iron ore is the red hematite of Cumberland and North Lancashire, which is an oxide of iron easily reduced to the pure metal. The brown hematite, not quite so rich in iron, is mined in South Wales, the Forest of Dean, Northamptonshire, and Antrim. Blackband and clayband iron ores, impure carbonates of iron, are common in most of our coalfields, as, for instance, in the Scottish Lowlands. The fact that iron and coal so frequently occur together has had much to do with the rapid development of the manufacture of iron in the British Isles. Another great advantage is that lime, which is used as a flux in smelting, is generally also present in the same region, together with a plentiful supply of fireclay.

Middlesbrough has become the most important iron-smelting centre in Britain since the discovery of a suitable method of obtaining iron from the ironclays which form much of the Cleveland Hills in north-east Yorkshire. It obtains coal from the Durham and Northumberland field, and limestone is found comparatively near. Magnetic or black iron ore, the finest of all, is imported from Sweden to the ports of Durham and Northumberland, to be smelted mainly

at Middlesbrough, Stockton, Darlington, and the Tyne ports. The Scottish Lowlands are important iron centres. The local blackband and clayband iron ores are supplemented by red hematite from Spain. Glasgow, Airdrie, Coatbridge, Motherwell, and Kilmarnock are the chief centres. Barrow is the great centre for smelting the red hematite of the Furness region, with coal brought from Cumberland, Scotland, or Lancashire. South Wales receives most of the great imports of Spanish iron ores, through Swansea, Cardiff, and Newport, and the smelting is carried on at Newport, Merthyr Tydfil, and other centres. The iron ore of the Midlands is smelted in and around Birmingham, at Wolverhampton, Dudley, Walsall, Wednesbury, and other places, mainly in South Staffordshire. Iron-smelting is important in the West Riding of Yorkshire, especially at Rotherham.

**Other Metals.**—Traces of the precious metals are found in many parts of the United Kingdom, but rarely in quantities sufficient to pay working expenses.

The Cornish peninsula has long been one of the chief European sources of tin. Copper is also found, but the ore is now almost exhausted. Zinc is mined along with lead in the North of Wales and in Northumberland. Lead, in the form of silver-lead ore, from which both metals are extracted, is also found in the Lead Hills in Scotland, in Cumberland, Northumberland, Wales, the Isle of Man, and the Wicklow Mountains in Ireland.

**Peat.**—In Ireland, northern Scotland, and other regions where great peat-bogs exist and coalfields are distant, peat is cut and dried for fuel. In Ireland it is even used industrially; and this use of peat will

largely develop with the discovery of a suitable process for turning it into coke.

**Oil-shale.**—In the midlands of Scotland, more especially in Midlothian, West Lothian, and Fife, large quantities of oil-shale are mined. This oil-shale is a compressed black clay, from which burning and lubricating oils can be distilled and candles and other paraffin products extracted.

**Salt.**—One of the most useful minerals is salt. On many parts of the coast it is obtained by evaporating sea-water, but great beds of rock-salt exist in the valley of the Weaver in Cheshire (near Northwich), at Droitwich in Worcestershire, and in south-east Durham. From these beds salt is obtained either by mining or by pumping the brine, but principally by the latter process. In addition to its domestic utility, salt is used in Worcester to form a glaze for pottery, and in Cheshire, South Lancashire, and in the north-east of England in various chemical industries.

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## CHAPTER IV.

### DISTRIBUTION OF MANUFACTURES AND MANUFACTURING CENTRES.

**Rise of Manufactures.**—The manufactures of the British Isles, now so important a branch of national activity, developed but slowly until last century. They grew out of the domestic industries necessary in an early stage of society, when every household was more or less self-supporting. Then, doubtless, every housewife spun wool or flax into yarn, wove the yarn into

cloth, and made the cloth into clothes and napery, while the men provided shelter, weapons, and implements.

One of the first trades to become important was that of the smith. Our Teutonic forefathers deified Thor the Hammerer. Confined in early times to the forging of armour, weapons, and implements, the smith's trade has now become increasingly complex with the extended use of iron in the arts of peace and war, until at the present day engineering is one of our most important occupations.

In the same way the other domestic industries of primitive society have developed into highly-skilled industries carried on by specially-trained workmen. Spinning or weaving now forms the only occupation of thousands of people. The grinding of grain into meal, the baking of flour, and the fermenting of grain have similarly become special trades practised by great bodies of men. The tanning of hides and the making of leather goods are now also special occupations. With the opening up of the country the trades connected with transport of various kinds grew up, developing later into the great railway industries. The ancient Briton made his small canoe in the roughest way; the modern Briton constructs great ships which sail to the uttermost parts of the earth.

**Classification.**—Manufactures can be classified in several ways, as, for instance, those dealing with the production of food, those having reference to shelter or protection, and those concerned with transport. Another possible classification is according to the nature of the raw material—mineral, vegetable, or animal; still another according to the process of manu-

facture—mechanical, chemical, or biological. For instance, the making of cloth is a mechanical process, the making of dyes a chemical one, and brewing a biological one. No hard-and-fast line, however, can be drawn, for the manufacturer of cloth often dyes it, and the brewer has chemical as well as biological processes to consider. The problem of the manufacturer—to transform some natural product into an artificial one, which will be of greater use than the unworked raw material—is on the whole a simpler one than the brewer's, which is to transform organic materials into their most utilisable form. Here we shall deal first with the mechanical industries connected with clothing, shelter, and protection, such as the textile and iron industries, and then with the chemical and biological ones.

### **The Textile Industries.**

**Historical.**—The textile or spinning and weaving industries have grown very gradually. Several unsuccessful attempts were made by English kings to introduce them as special industries before the efforts of Edward III, in the fourteenth century, led to the settlement of weavers in East Anglia and elsewhere. The chief centre was round Norwich, more particularly in the village of Worstead, which has given its name to worsted goods. Numerous other manufacturing centres existed over the chalk Downs. The populous and prosperous south-east of England was the chief industrial region until the discovery of coal led to a shifting of the woollen centres.

Woollen and linen manufactures had grown up both in Lancashire and Yorkshire; but these were far

removed from the more densely populated regions. Kendal green was a famous cloth in the Middle Ages. Manchester cottons, probably a mixture of wool and linen, are also mentioned in old works. At the end of the fifteenth century the Yorkshire woollen manufacture was stimulated by the settlement of a large number of Flemish weavers. With the application of coal to industry, those manufacturing centres which were favourably situated for obtaining wool and coal, and were well supplied with water for scouring and dyeing, grew at the expense of the others. The once great woollen manufacture of Norwich declined because neither coal nor water-power was available.

**Sources of Power.**—During the past century steam has been the chief source of power used in industry. To-day the use of electricity is becoming more and more common, steam being used to generate it. Attempts are being made to cheapen its production by utilising wind and water power (forces which at present are but little used) for this purpose; and probably these two sources of power, as well as the tides, will be more and more utilised in the twentieth century. This may lead to a considerable rearrangement of the industrial centres, which would tend to develop in regions with abundant water-power—that is, in the mountainous parts of the country—and more particularly near the coast, where water transport is available for obtaining raw material and distributing manufactured goods.

**The Manufacture of Woollens.**—Before the arts of spinning and weaving were discovered, men probably pounded the wool fibres together into a felt. Before



wool is manufactured at the present day it is first of all cleaned and scoured in pure soft water, such as that of the streams of the Southern Uplands of Scotland, where there is no limestone. A little alkali is added to the water to remove the natural grease in the wool. The wool is next teased to separate the fibres, and oiled to keep them from snapping in the course of carding and spinning. Carding is the process of separating each fibre of the wool, after which a number are condensed together and then spun or twisted round and round into yarn. The yarn is next woven into cloth. A series of parallel threads of yarn is fixed to form a warp, and another thread is made to cross this warp at right angles (under some threads, above others), forming the weft of the cloth. The cloth is then scoured to clean and soften it, and milled or felted to make it more compact. The old way of felting or fulling was to soap the cloth, and then beat it with big hammers; but it is now milled in a machine. The felting property, which is peculiar to wool and hair, makes woollen cloth denser and more compact than that made from vegetable fibres. Dyeing may be done at any stage of manufacture, most commonly after the wool is scoured or the yarn spun; but for some purposes the material is not dyed until after the cloth is woven.

**Woollen Manufacturing Centres.**—Although all the wool produced in this country is not manufactured in it, and considerable quantities are exported to other woollen manufacturing centres on the Continent, the home supply of wool does not suffice for the woollen manufactories. Much is brought from Australia, South Africa, and other countries; and manufacturing

centres near good ports have an advantage over others, especially if they are also near a good coal and water supply. At the present time the woollen manufacture is carried on in three chief centres—in Yorkshire, the west of England, and the Tweed valley.

The **Yorkshire woollen centre** is exceptionally favourably situated as regards the easy supply of raw material and the distribution of the manufactured articles. It lies half-way between the Irish and the North Seas, with the great ports of Liverpool on the west and Hull on the east. The hills of Yorkshire afford pasture for innumerable sheep, its coalfield is of almost inexhaustible richness, and it is excellently watered. The chief centre of the woollen manufacture is Leeds, on the Aire. Many other large towns have grown up, such as Bradford, and the towns in the Calder valley—Halifax, Huddersfield, and Dewsbury.



Woollen District.

The **West of England woollen centre** has also its port, Bristol; the coalfields of Bristol and the Forest of Dean are near; and numerous streams drain the Cotswolds. Stroud in Gloucestershire, and Bradford in Wiltshire, are the most important centres. The scarlet cloth for uniforms is manufactured at Stroud.

The **South of Scotland woollen centre** has some of these advantages—uplands for pasture, mountain rills and streams, but less accessible coalfields. Peebles,

Galashiels, Selkirk, Hawick, and Jedburgh on the Tweed and its tributaries, Langholm on the Esk, and Dumfries on the Nith are the chief manufacturing towns. They manufacture cheviots and tweeds (the former so named from the hills where the sheep feed).

Outside these three centres the chief woollen manufacturing towns are Bury and Rochdale, both near Yorkshire, which combine woollen and cotton manufactures. Some woollen manufacture is carried on on a small scale in many towns both in Great Britain and Ireland, more particularly where wool is plentiful. Flannels are made at Welshpool and other towns in the upper valley of the Severn, which are near the West Shropshire coalfield. Witney in Oxfordshire is noted for blankets. Kidderminster and Wilton make carpets. Leicester hosiery has long been famous. Hand-loom weaving has not quite disappeared, and the strongest cloth made in the British Isles is probably the Harris tweed, manufactured in this way in the Outer Hebrides.

**The Manufacture of Linens.**—Linen thread and cloth are made from the fibres of the flax-plant. The plants are uprooted as the seeds ripen, and these are taken off or 'rippled' to make linseed oil and cake. The fibres are separated from each other by allowing the stem to rot or partially rot—that is, ferment—either in soft water or simply on wet grass. They are next dried, and then broken, which permits the removal of the woody parts. This process is called 'scutching.' The fibres are combed or 'heckled,' and the long fibres, or 'line,' separated from the short fibres, or 'tow,' and the line is prepared for spinning, the next process it undergoes. Successful spinning requires a certain humidity of the air, and the finer linen threads are spun when quite wet. The linen yarn is finally woven into cloth.

**Linen Manufacturing Centres.**—Historically the manufacture of linen is next in importance to that of

wool; flax, like wool, being a home product. In the time of Charles I., Wentworth introduced the cultivation of flax into the north-east of Ireland, which is the principal seat of the production of lint and linen at the present day. Although Ulster has no coal, except at Dungannon, it is conveniently situated opposite the Ayrshire and Cumberland coalfields, whence cheap supplies can be procured. The water of Ulster is very suitable for bleaching linen, which is the chief manufacture of Ireland. Belfast is by far the most important centre, making all kinds of linen goods, but especially the finer sorts. Lisburn, Lurgan, and most of the towns of Ulster manufacture lawn, cambric, and fine linen. Outside Ireland linen is spun and woven principally in Fife, where Dunfermline, the chief centre, is noted for its table-linen. At Kirkcaldy coarser linens are made; and in Forfarshire—at Dundee, Brechin, and Arbroath—still coarser goods, such as canvas and sailcloth, are woven. Fife possesses several special advantages. Flax is imported from the Baltic, which lies opposite to Fife; and coal is obtained from the Fife and Clackmannan coalfields. The constancy of the temperature and of the humidity of the air are favourable climatic conditions. Barnsley, the only important centre in England, lies in Yorkshire, east of the Pennines, and, like Kirkcaldy, makes upholstery linen.

**The Manufacture of Cotton.**—Raw cotton consists of the fibrous hairs surrounding the seeds of the cotton-plant, which belongs to the mallow and hollyhock family. It flourishes between the tropics, but is now grown in favourable places in the warmer parts of the temperate regions. The fine white hairs are

separated from the cotton seeds by a machine called the gin. The seeds, like those of the flax-plant, yield oil and form a food-stuff for animals, while the stalks are made into paper. The 'cotton-wool' is carded, drawn, and spun into yarn, and then woven into cloth. Little more than a century ago cotton yarn could not be spun strong enough to make the warp, for which linen or wool was used. Nowadays both warp and weft are of cotton, and this pure cotton cloth is called calico. Cotton is also used mixed with linen, with wool, with silk, and other fibres to make different varieties of yarns and cloth.

**Cotton Manufacturing Centres.**—All raw cotton is imported. Consequently the regions near the great ports have greater facilities for obtaining it than those far inland; and, as most of it comes from America, the west coast ports are more favourably situated than those on the east. Bristol, Liverpool, and Glasgow, the three great ports of communication with America, are respectively connected with the three great western coalfields of South Wales, Lancashire, and Scotland. The climate and waters of Lancashire and Scotland are specially favourable for the cotton manufacture, which requires a fairly damp atmosphere for successful spinning and weaving. A great development of the cotton manufacture has occurred in the past century. Formerly cotton was mixed with other fibres; but since the introduction of steam-driven machinery the manufacture of pure cotton goods has developed until it is now the most important industry of the country. A century ago the cotton manufactured was worth little more than one-twentieth of the woollen; but at the present day it is worth double, while the value

of the linen manufactured is only one-fifth that of the cotton. By far the greatest proportion is manufactured in South Lancashire, in the towns surrounding Manchester, such as Stockport (which, however, is in Cheshire), Ashton, and Stalybridge;\* Oldham, Rochdale, Bury, and Bolton; and in the towns on the north of the Lancashire coalfield, Burnley, Accrington, Blackburn, and Preston. Manchester manufactures little, but is the great market and distributing centre.



Cotton District.

In Scotland cotton is manufactured—chiefly into cotton thread—at Paisley.

Most machine-made lace is composed of cotton threads, for the linen threads of which the beautiful, delicate hand-made lace is formed are too fine for machinery to manipulate. Nottingham is the chief centre of cotton-lace and net manufacture.

**Cotton, Woollen, and Linen Manufactures.**—A century ago the value of cotton, woollen, and linen yarns and piece goods produced in Great Britain and Ireland was about £22,000,000—say,

\* Stalybridge is partly in Lancashire, but principally in Cheshire.

woollen, £17,000,000 ; linen, £4,000,000 ; and cotton, £1,000,000. Of recent years the value has been about £170,000,000—say, cotton, £100,000,000 ; woollen, £50,000,000 ; and linen, £20,000,000. The total amount of capital employed is about £200,000,000 ; and at least 5,000,000 people—men, women, and children—are dependent upon these textile industries for their livelihood. Moreover, one-half of the value of British and Irish products exported consists of textiles.\*

**Jute and Hemp Manufactures.**—Jute is a plant of the lime-tree order, which flourishes in hot, moist climates, in regions with rich soil, such as the Ganges delta. It grows five, ten, and even more feet high, and the fibre is separated by rotting, like linen from the flax-stems. The manufacture of yarn and cloth is carried on very much like that of linen, but all the fibres are carded. Jute is a long, strong, silky fibre, and the finer tissues assume a silky appearance. Unfortunately it is difficult to dye in fast colours. Jute carpets, curtains, handkerchiefs, and fabrics may be made ; but the staple jute product is coarse sacking for bags. The manufacture of jute is almost entirely confined to Dundee, Arbroath, and Montrose, all in Forfarshire.

In these towns hemp is also spun, and rope-making is carried on all round the coast, as every seaport requires it. Hemp is grown in most European and many other countries ; but our supply comes largely from Russia, especially from Poland. New Zealand hemp and the Manila hemp are strong fibres derived from quite different plants.

**Silk Manufacture.**—Silk, like wool, is a fibre of animal origin. It is secreted as a fine thread by the caterpillar or larva developed from the egg of a moth.

\* Thomas Ellison in the *Statesman's Year Book*, 1899.

This silk thread forms a cocoon, within which the larva passes a quiescent stage of its life; then it dissolves part of the silk cocoon, and emerges as a moth again. The silk-rearer heats the finished cocoon, and thus kills the larva. He then softens with hot water the gum binding the silk threads, and unwinds and reels up three or four or more of the fine fibres together as one thread, known as raw silk. This is cleaned and twisted into thread and woven; but sometimes the raw silk itself is used for the warp. Spitalfields, in London, was long famous for silk-weaving; but few looms are now employed there. The manufacture of silk is scattered up and down the country, the chief centres being Macclesfield, Derby, Coventry, and Leek (threads for needlework), while silk waste is manufactured in Bradford. The raw silk is all imported.

**Fibres for Textile Manufactures.**—The fibres used in our textile industries are few in number. Flax, cotton, jute, and hemp are of vegetable origin; wool and silk of animal origin. Vegetable fibres, like the ramie or China grass, have been tried. China grass is an exceptionally strong and beautiful fibre, but hitherto the difficulties of preparing it for spinning have prevented its general adoption for cloth-making. Several hundred fibres at least exist which might be used for textile purposes; and it is desirable that systematic experiments should be made to test the value of each of these, samples of which are to be found in the great collection at Kew Gardens.

### **The Iron Industries.**

In the past century iron, and in recent years steel, a specially prepared form of iron, have largely replaced wood as a constructive material. Iron beams and pillars are used as supports in building; iron or steel



is the most common material for bridges; rails are laid with it, and it enters largely into the construction of trucks and of carriages; the locomotives that draw the trains are made of it, and we traverse our roads on steel bicycles. Machinery of all kinds is mainly constructed of steel; our ships are almost entirely built with that metal, and the guns and projectiles of our navy and army are principally composed of iron in some form or other. Less striking, but equally important, is its use in bolts, screws, and rivets, for purposes too numerous to mention.

**South Staffordshire** has long been a famous centre of the iron manufacture, for the timber of its forests was used for smelting the iron ore of the neighbourhood long before its coal was utilised. All kinds of metallic goods are turned out here, from the proverbial pin at Birmingham to the anchor at Tipton. Nail and chain making are carried on at Cradley Heath; locks are made at Walsall and Wolverhampton; keys at Wednesbury; and tin-plate, gun-barrels, armour-plate, great girders, and railway plant of all kinds are turned out in the numerous factories of the busy district of which Birmingham is the chief city. This region is distinguished among the other industrial regions of the country by its large number of small workshops.

On the Yorkshire-Nottinghamshire coalfield the iron industries are centred round Sheffield. The **Sheffield district** is famous for cutlery and tools of every kind, and, in addition, every sort of steel work is made—iron plates, engine castings, shot, rails, and machinery of all kinds. Both coal and iron are found in the neighbourhood; but for the finer steels the black iron ores from Sweden are imported. Rock is also found

near Sheffield which makes exceptionally fine grindstones, suitable for use in the making of cutlery. Here, as in the Birmingham district, electroplating is an important trade. Leeds is also an important centre for iron goods.

**Textile Machinery** to supply the woollen manufacture of the West Riding of Yorkshire is made at Keighley and Bradford. The machinery used in the cotton manufacture is made on the Lancashire coalfield at Oldham, Rochdale, Bury and Manchester. Here engineering works turning out materials for railways and buildings are numerous.

On the Northumberland-Durham coalfield railway plant construction, shipbuilding, and gun-making are the chief metallic industries. This region is the most important in England for shipbuilding, which is carried on at Middlesbrough on the Tees, Sunderland on the Wear, and at the Tyne ports, North and South Shields and Newcastle. On the Tyne is the famous ordnance factory at Elswick.

Shipbuilding is also carried on at Barrow-in-Furness and at Belfast, which obtains its iron from Scotland.

All kinds of metallic work are carried on on the Scottish coalfield, but more particularly in and around Glasgow. The shipbuilding on the Clyde, at Greenock, Port-Glasgow, Dumbarton and Glasgow, is still the most important in the world. The engineering works of Glasgow turn out railway plant of all kinds, including locomotives, machinery, and every sort of iron goods.

**Recent Developments.**—In recent years considerable changes have taken place in the metal industries. The tinplate industry, which flourishes in South Wales,

declined with its growth in the United States, but has gained new markets and recovered again. The export of iron has become relatively less important. In most of its markets the United Kingdom has to compete with the manufactures of other nations, more particularly with those of the United States, Germany, and Belgium. At the present time, however (1899), the iron industry was never more active in the United Kingdom. This is due to the development of electrical engineering for supplying electric light and electric tramways; to the growth of cable and ordinary tramways in our great cities; and to the extra activity in all the shipbuilding yards, a consequence partly of the actual demand for greater transport facilities for the world's rapidly growing commerce, and partly of the great increase of naval armaments by our own and other countries, a fair proportion of all foreign ships being built in the United Kingdom.

The universal use of the bicycle in recent years has led in Coventry to the substitution of this manufacture for silk-ribbon weaving, which had for some years been declining. Bicycle-making is also actively carried on in most of the other iron centres, more particularly in Birmingham and Wolverhampton. Sewing-machines are made near Glasgow. Motor-car building is a new industry which is still in its infancy in Britain.

### **The Chemical Industries.**

It is difficult to overestimate the importance of chemical industries in the modern industrial world. The only iron ores successfully smelted in this country were the hematites of the Forest of Dean and Furness, until, by the proper application of physical and

chemical processes, ores such as those of the Cleveland Hills in Yorkshire, formerly refractory, were rendered suitable for smelting. In addition to improved processes of metal-working, many by-products of various manufactures, which were formerly considered waste, have been utilised as raw materials by the application of proper chemical methods. Coal-tar, a by-product in the manufacture of gas, has been applied to many uses, and, among others, is made to yield an important series of aniline dyes. Dye substances were formerly either of vegetable origin, like madder and indigo; animal, like cochineal; or pulverised minerals, like hematite. Now aniline dyes are mainly employed.

Salt, mined in Cheshire and Durham, is used in the chemical-works of South Lancashire and the Tyne, and as the basis of alkalies for bleaching and other purposes.

Sulphuric acid, used in many industries, is manufactured in the centres just named and around Glasgow.

Glass-making from silica (pure sand, quartz, flint), mixed with salt, soda, lime, potash, and lead, is the principal industry of St Helens in South Lancashire, and is important at Newcastle. (For potteries, see pp. 36 and 44.)

Soap is made by heating fatty substances with soda to form hard soaps, or with potash to form soft soaps. Tallow and vegetable oils—especially palm, coco-nut, and cotton-seed oils—are used. As the latter are all imported, soap-making naturally flourishes in a seaport such as Glasgow. Glycerine is a by-product of soap-making.

The manufacture of candles, paraffin, &c. from oil-shale is carried on mainly in Mid and West Lothian.

Paper is made by bleaching vegetable fibres, usually esparto grass, or wood fibre combined with cotton or linen rags. These are reduced to a fine pulp, which is rolled and dried into a continuous web of paper. In Midlothian, round Edinburgh, and in Kent and London, where most printing is done, are many printing-paper factories; but many mills exist in other parts of the country.

Tanning is a process for preserving the hides of all kinds of animals and transforming them into leather. Most of the domestic animals supply the skins, which are treated with some solution containing tannin, such as can be obtained from oak and other bark, acorns (valonia), cutch, gambier, &c., or compounds of chromium.

#### Industries connected with Food and Drink.

**Preserved Foods.**—In olden times food for winter was preserved by drying, smoking, and salting. At the present day, when transport facilities provide a continual supply of fresh food, this is no longer so necessary; but fish and bacon are still salted and smoked to preserve them and to improve their flavour. At the fishing centres, more particularly those distant from market, drying, salting, and smoking fish is an important occupation. Herring, haddock, and cod are the chief fish preserved. Finnan (Findon) haddocks in Scotland, and Yarmouth bloaters in England, are important articles of trade.

A little home meat is preserved in tins for use at sea; but the great bulk of our tinned food is imported.

Small fruits are made into jams and jellies in London and the neighbourhood, and on fruit-farms

in other parts of the country. Orange marmalade is made in Dundee and elsewhere.

**Sugar** is refined at Greenock, and made into sweet-meats in all large cities. It is combined with cacao (commonly called cocoa) to make chocolate in Bristol, York, and other places.

**Dairy Produce**, such as butter and cheese, is made in Ayrshire, Cheshire, the Midlands, Gloucestershire, and the south-western counties of England, and in Ireland.

**Brewing and Distilling**.—The juice of apples and pears is fermented to form cider and perry in the south-west of England, especially in Hereford and Devon; but by far the most important drinks manufactured in the British Isles are beer and whisky, both derived from barley.

Beer is made by allowing the barley grains to germinate, when the starch of the grain is changed to sugar, and the grain is called malt. The sweetened liquid extracted from the malt is fermented by the yeast-plant, and flavoured with hops. Beer is chiefly brewed in the three capitals, London, Edinburgh, and Dublin, and at Burton-on-Trent, which is near the hop-fields of Worcestershire, and possesses a large and suitable water-supply. The anthracite of Wales can be easily transported to Burton, which has a world-wide celebrity for its beer. Brewing is also carried on in all our large cities. Stout, a beer impregnated with burnt sugar, is mainly brewed in London, Burton, and Dublin.

In Scotland and Ireland the malted liquor is distilled to form whisky, which is manufactured in all the large cities. In Ireland and the Highlands of Scotland a special flavour is imparted to the whisky by the smoke of burning peat.

## CHAPTER V.

## TRADE ROUTES AND CENTRES.

**Towns and Trade.**—In Roman times almost all the towns were fortified places. Many of them can be identified by their names—Chester, Worcester, Winchester, Cirencester, &c.—which are derived from *castra*, the Latin word for camp. Even at that date, however, and, indeed, from the earliest days of human habitation in our islands, certain spots, such as fords, or the junction of two valleys or rivers, presented special advantages for meeting-places, more especially between those who had commodities to exchange. As population and trade increased most of these naturally grew into towns of greater or less importance. At a later date abbeys and monasteries attracted a considerable population, composed of members of religious houses, their pupils and servants, those who resorted to them for healing and other benefits, and the artisans, craftsmen, and traders required in a growing community. Our towns, therefore, have grown up in various ways. Some, like Warwick or Chester, developed out of fortified places; others, like Oxford, out of monasteries; others again out of such centres of local trade and traffic as fords, bridges, or ports. Many of these, such as Wallingford, Cambridge, Newport, Exmouth, can be recognised by their names. A group of ancient market centres, Chipping, Chipping Norton, Chippenham, Chepstead, Chepstow, and others, were places where *chapmen* or merchants met to sell or barter

their wares. These owed their importance to the fact that shopkeeping was little developed in the early Middle Ages, and that trade was chiefly carried on at such markets and at periodical fairs, held once a year or oftener, and lasting for days or weeks, like Stourbridge Fair, near Cambridge, which was known throughout Western Europe, and flourished in full vigour up to the middle of the eighteenth century.

In addition to the many towns well fitted to be busy centres of local trade, a few have always possessed special natural advantages marking them out for commercial greatness. Of such we have an excellent example in London, standing at the head of the tidal waters of the Thames. Here a ford existed in early times, replaced later by a bridge. Combining facilities for sea and land communication, and serving as an outlet for the rich south-east of England, London early became the chief commercial town of England, and replaced Winchester as the political capital. Bristol, on the Severn estuary, possessed a very similar situation; but, commanding a less rich district, and being comparatively remote from the Continent, it never became the rival of London.

The modern development of manufactures and railways has led to a corresponding development of towns. The application of steam-power to production has made the coalfields industrial centres, while its application to transport has facilitated the rise of many inland towns, especially of those at the intersection of different routes. Other things being equal, however, proximity to the sea must ever be an advantage; and the rapid growth of our foreign trade, combined with that of our manufactures, has had the most



marked effect on the prosperity of our ports and of the manufacturing towns near them. At the present day two opposite tendencies are at work. One is shown by the disposition of industry to move to the sea. This is illustrated by the removal of many important engineering firms from inland to coast towns. The second is shown by the construction of the Manchester Ship-Canal, which aims at bringing the advantages of a maritime situation, with its concomitants of cheap and convenient water-transport, to an inland centre.

**Internal Transport.**—Internal trade is carried on by road, railway, and canal, and by coasting-vessels. The country is covered by a network of railways and canals, which is closest around the great centres, London, Birmingham, Manchester, Sheffield, Leeds, Liverpool, and Newcastle.

**Roads.**—Roads are seldom employed for long-distance traffic, except where there are no other means of transport. Their chief use is to distribute goods brought by rail, canal, or sea to the nearest station or port. Carts of various kinds are generally employed for this purpose. The improvement in motors is giving rise to a new traction traffic.

**Canals.**—The plains of England readily lend themselves to the construction of canals, which cross them in every direction. Most of our canals were made between 1770 and 1830. The utility of many is impaired by their being both too shallow and too narrow to permit barges of fair length, breadth, and depth to pass from one canal to another. Canal-boats are the cheapest and most commodious means of inland transport for any heavy and bulky goods that are not easily damaged, such as coal, metals, hardware, building

materials of all kinds; and the deepening and widening of our canals is, therefore, an urgent necessity:

Most of the rivers of the plain are canalised and joined by important canals. The chief are those uniting the Trent to the Mersey, the Severn, the Thames, and the rivers flowing to the Wash; those joining Thames and Severn, Severn and Mersey, Mersey and Yorkshire Ouse; the Forth and Clyde Canal in Scotland; and the canals of the Irish plain.

The Thames and the Severn are both canalised, and are connected by two canals, one making use of the Kennet and the Bristol Avon, the other passing from Lechlade on the Thames by Stroud to the Severn. The Thames and the Trent are joined by means of the Grand Junction and Grand Union Canals through Brentford, Watford, Wolverton, Leicester, and the Soar, with branches through Northampton to the Nen, and through Market Harborough to the Welland. The Oxford Canal runs northwards by Banbury, Rugby, and Nuneaton to Burton-on-Trent.

There is a great network of canals round Birmingham, which is joined to the Severn at Worcester, to the Trent by canals through Lichfield, and through Tamworth, and by the Warwick and Napton to the Oxford Canal, which is joined to the Grand Junction Canal.

An important canal system, the Trent and Mersey Canal, joins the Trent to the Mersey through the Potteries, making use of the river Weaver.

Three canals cross the Pennines. Two of these unite the Irwell at Manchester to the Calder; the southern one passing through Huddersfield, the northern one by Rochdale. Still farther north, the Leeds and Liverpool Canal passes through Blackburn, Burnley, and Skipton. A branch of this canal joins Preston and Blackburn.

The rivers flowing east into the Humber and the Wash are all canalised.

The Forth and Clyde are connected by canal from Grangemouth to Glasgow, with a connection to Edinburgh by the Union Canal. In Ireland the Grand and the Royal Canals join the Liffey to the Shannon. The former joins the Shannon between Lough Ree and Lough Derg, the latter near Longford. The Erne

and Shannon Canal connects these two rivers, and the Ulster Canal unites the Erne to the Blackwater and Lough Neagh, whence it connects with the sea by the Bann and by another canal with the Lagan. The deep Newry Canal, three miles long, joins Newry to Carlingford Lough.

**Ship-Canals.**—There are several ship-canals which are of importance in connection with the coasting and foreign trade. Some of these are natural waterways artificially deepened. All the chief rivers are constantly dredged to allow the largest vessels to enter the docks of the great ports, and thus the Thames, the Tyne, the Bristol Avon, and the Clyde may be regarded as great ship-canals. A ship-canal joins Gloucester to the navigable part of the Severn. The great Manchester Ship-Canal, from the Mersey to Manchester, is wholly artificial.

The Manchester Ship-Canal is thirty-five and a half miles long, and unites the Mersey estuary at Eastham with Manchester, *via* Runcorn and Latchford, by a waterway twenty-six feet deep and one hundred and twenty feet wide at the bottom. The first twenty-one miles to Latchford are without locks. Between Latchford and the docks at Salford and Manchester, where there are over six miles of quays, four locks raise vessels sixty feet.

In Scotland the Crinan Canal saves a long voyage round the Mull of Kintyre to vessels going from Glasgow to the north-west; and the Caledonian Canal, through Glenmore, allows vessels of moderate draught to pass from Loch Linnhe to the Moray Firth, and avoid the stormy voyage across the Pentland Firth.

**Railways.**—On the plains railways compete with canals for the transport of commodities, while in the more mountainous districts they are practically the only means of carrying on trade.

London, the capital as well as the chief port and

market, is naturally the centre of the railway system of the country. From this centre important lines radiate in all directions, like the spokes of a great wheel. The terminal points are either ports or great industrial towns, which, in their turn, are the centres of minor systems of radiating lines, connecting them with each other. The country is thus covered with a network of lines too complex to describe in detail, by which every town of any size is connected with the Metropolis, ports, and industrial centres, frequently by several alternative routes. This network is most closely interwoven on the plains, while in the mountainous districts all the great valleys form railway routes, except in the outlying and thinly peopled districts of Wales and Scotland, which are of little commercial importance. The effect of this keen competition is to facilitate transport and to reduce rates.

In 1850 there were less than seven thousand miles of railways in the United Kingdom. During the next twenty years the mileage was more than doubled. At the end of 1903 the total length of railways was over twenty-two thousand miles, of which fifteen thousand miles were in England and Wales, over three thousand six hundred miles in Scotland, and rather less in Ireland.

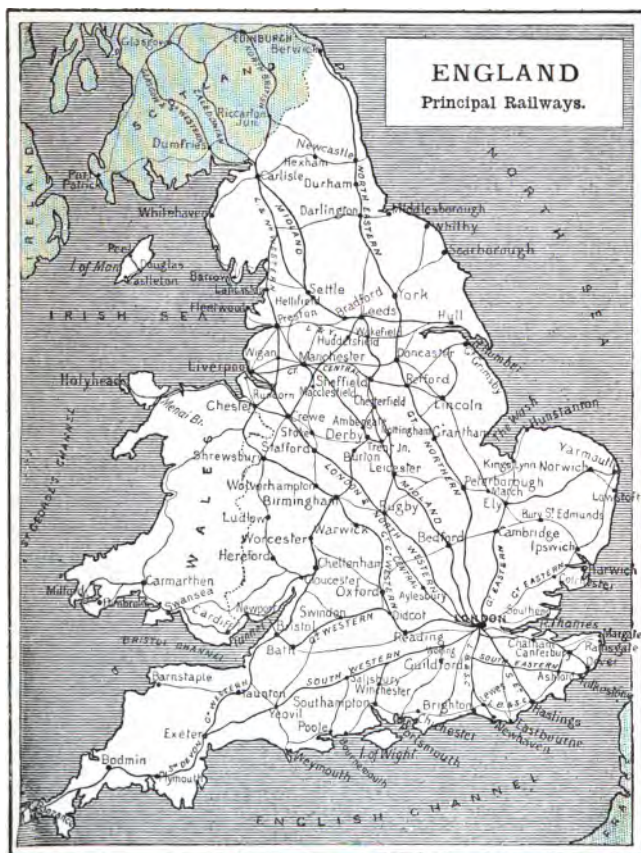
From a commercial point of view a detailed knowledge of the great main lines is of less importance than a clear understanding of the facilities of transport between the various industrial towns and districts and the ports or other centres from which they obtain raw materials, or to which they distribute finished products. For convenience of reference, however, the customary grouping by main lines—a system based rather on

passenger than commercial traffic—is followed; but it should be remembered that this simpler classification tends to disguise the complexity of the railway systems from a commercial point of view.

**Main Lines connecting London with the Western and Southern Counties.**—The Great Western (G.W.R.), with the longest mileage in the United Kingdom, connects London with Birkenhead through the manufacturing centres of the Midland coalfield, and with Exeter and the southern counties. The London and South-Western (L.S.W.R.) competes with the G.W.R. for the Exeter traffic, and carries a considerable proportion of the French and Continental traffic by way of Southampton. The traffic of the south-eastern counties—with much for France—is divided among the London, Brighton, and South Coast (L.B.S.C.R.), running to Portsmouth and Newhaven; and the South-Eastern and Chatham (S.E. & C.R.), running to Dover, and connecting with Holland through Queenborough. The eastern counties traffic—with much for the Continent by way of Holland and Belgium—is carried by the Great Eastern (G.E.R.).

The G.W.R. main line runs from London (Paddington) through Reading, Didcot, Swindon, Chippenham (branch to Weymouth, for Channel Islands service), Bath, and Bristol (branch to South Wales by the Severn Tunnel), to Exeter, with connections to Barnstaple, Plymouth, and Penzance. Its main branches are (a) through Didcot, Oxford, Birmingham, Shrewsbury, and Chester (for the Welsh and Irish traffic) to Birkenhead; (b) through Swindon to Gloucester, and to Cardiff, Swansea, Pembroke, Milford, and Fishguard.

The L.S.W.R. runs from London (Waterloo) through Woking (branch to Portsmouth), Basingstoke (branch to Winchester and Southampton), Salisbury (branch to Weymouth), and Yeovil Junction to Exeter, whence it is continued to Plymouth.



The L.B.S.C.R. runs from London (Victoria and London Bridge) through Oxted to Eastbourne, through Lewes to Newhaven, through Redhill to Brighton, through Chichester to Portsmouth; and a line follows the south coast from Hastings to Portsmouth.

The S.E. & C.R. (Chatham division) runs from London (Victoria, Holborn Viaduct, and St Paul's) through Gravesend, Rochester, Chatham, Sittingbourne (for Sheerness and Queenborough), Faversham (for Margate and Ramsgate), and Canterbury to Dover.

The S.E. & C.R. (S.E. division) runs from London (Charing Cross and London Bridge) through Tunbridge (branch to Hastings), Ashford (branch through Canterbury to Ramsgate and Margate), and Folkestone to Dover.

The G.E.R. runs from London (Liverpool Street) through Colchester, Manningtree Junction (branch to Harwich), Ipswich (branch to Norwich), Beccles Junction (branch to Lowestoft), to Great Yarmouth. Another line runs from London through Cambridge, Ely (branch through Lynn to Hunstanton, and another to Norwich), March (branch to Peterborough), and Lincoln to Doncaster, connecting there with the G.N.R. and the N.E.R.

**Main Lines connecting London with the Midlands and North of England.**—The traffic of the midland and northern counties is carried from London by the Great Northern (G.N.R.), continued by the North-Eastern (N.E.R.)—opening up the Yorkshire and Northumberland and Durham coalfields—to Berwick, the east coast centre for the Scottish traffic; and by the London and North-Western (L.N.W.R.)—connecting the capital with the great industrial district of South Lancashire—or the Midland (M.R.)—connecting it with the Midland and Yorkshire industrial towns—to Carlisle, the west coast centre.

The Great Central (G.C.R.), formerly the Manchester, Sheffield, and Lincoln, also connects the capital with the manufacturing towns of the Lancashire and Yorkshire coalfields. The Lancashire and Yorkshire

(L. & Y.R.) serves south Lancashire and Yorkshire, but is not directly connected with the Metropolis.

The G.N.R. runs from London (King's Cross) through Peterborough and Retford to Doncaster, whence it is continued by the N.E.R.—radiating over the north-eastern counties—through York, Darlington, Durham, and Newcastle to Berwick.

The L.N.W.R. runs from London (Euston) through Rugby (branches to Peterborough and Birmingham), Stafford (branch to Birmingham), Crewe, Wigan, Preston, and Lancaster, to Carlisle. From Crewe, branches run (a) by Chester and the Menai Bridge to Holyhead (for the North Wales and Irish traffic); (b) through Stockport and Huddersfield to Leeds; (c) through Stockport to Manchester; (d) to Liverpool over Runcorn Bridge. From Liverpool a line runs to Leeds *via* Manchester.

The M.R. runs from London (St Pancras) through Bedford, Leicester (branches to Peterborough and Rugby), Trent Junction (branch to Derby, and branch to Nottingham and Lincoln), Chesterfield, Sheffield, Leeds, and Settle (branch to Morecambe), to Carlisle. Branches run (a) from Trent through Derby and Ambergate to Manchester and Liverpool, (b) from Bristol through Gloucester, Cheltenham, Birmingham, Burton, Derby, and Ambergate, connecting with the Carlisle line at Chesterfield.

Both the M.R. and L.N.W.R. pass through Carnforth to Barrow and West Cumberland over the Furness Railway.

The G.C.R. runs from London (Marylebone) through High Wycombe or Aylesbury, Rugby, Leicester, Nottingham, and Sheffield (branches to Lincoln and Grimsby) to Manchester (centre of the Cheshire lines) and Liverpool.

The L. & Y.R. main line runs from Liverpool by Wigan to Manchester, and by Wigan, Bolton, Rochdale, and Halifax to Bradford and Leeds. It serves all the towns of South Lancashire, connects with the M.R. at Normanton and Hellifield, and the L.N.W.R. at Preston, whence both lines run to Fleetwood.

The North Staffordshire serves the region it is named after, and runs through Stoke, from Crewe to Derby, and from Macclesfield to Stafford.

**Scottish, Welsh, and Irish Railways.**—The Scottish lines radiate from Edinburgh and Glasgow, but it is



convenient to trace them from Carlisle and Berwick, where they connect with the great English lines.

The three regular through passenger routes from London to Scotland are: (1) the East Coast Route by the G.N.R. and N.E.R. to Berwick, and thence by the eastern branch of the North British (N.B.R.) through Dunbar to Edinburgh and Glasgow; (2) the West Coast Route, by the L.N.W.R. to Carlisle, and thence by the Caledonian (C.R.) to Edinburgh, Perth, or Glasgow; and (3) the Midland Route, by the M.R. to Carlisle, and thence by the Western or Waverley branch of the N.B.R. to Edinburgh, or by the Glasgow and South-Western (G. & S.W.R.) to Glasgow.

Both the C.R. and N.B.R. main lines run to Aberdeen, where a connection is made with the Great North of Scotland (G.N.S.R.) for the north-eastern counties. Perth, reached by both lines, is the starting-point for the Highland Railway (H.R.), which opens up the Highlands and the northern counties; while Glasgow is the centre for the West Highland traffic, which is sent over the West Highland line by Loch Lomond and the desolate Moor of Rannoch to Fort William.

The C.R. connects with the English railways at Carlisle, and runs through Lockerbie, Carstairs (branch to Edinburgh on the east), Motherwell (branch to Glasgow on the west), Stirling, Dunblane (branch through Callander to Oban), Perth, and Forfar to Aberdeen.

The N.B.R. connects with the English railways both at Carlisle and Berwick. From Carlisle the western branch runs through Hawick and Galashiels (Tweed woollen district) to Edinburgh, outside which city it is joined by the eastern branch from Berwick. Glasgow is reached through Edinburgh either by Falkirk or by Bathgate and Airdrie. From Edinburgh the main line runs to



Dalmeny, and over the Forth and Tay Bridges to Dundee, Arbroath, Montrose, and Aberdeen. From Glasgow the West Highland line runs to Fort Augustus, Fort William, and Mallaig.

The G. & S.W.R. runs from Carlisle through Dumfries (branch to Stranraer) to Glasgow; and from Glasgow by Ayr to Stranraer.

The H.R. starts from Perth and follows a picturesque route along the glens and over the passes of the Highlands, through Dunkeld, Blair Athol, Aviemore (branch to Forres, Nairn, and Elgin), Inverness, Dingwall (branch to Strone Ferry), and Tain, to Wick and Thurso.

The G.N.S.R. runs from Aberdeen to Elgin, with branches to Banff, Peterhead, and Fraserburgh.

The Welsh traffic is chiefly carried on by the G.W.R. in the south and the L.N.W.R. in the north, both with numerous branches. The Cambrian has a considerable mileage in the centre. In South Wales numerous parallel lines running more or less north and south, sometimes in the valleys, but generally along the heights, connect the collieries with the coast.

In Ireland the railways radiate from Dublin. The Dublin, Wicklow, and Wexford Railway serves the counties named. The Great Southern and Western Railway runs to Cork and Limerick by Kildare and Charleville, with branches to Kilkenny and Athlone. The Midland Great Western crosses the island to Galway, Clifden, Westport, and Sligo. The Great Northern (Ireland) unites Dublin to Belfast and Londonderry through Drogheda and Dundalk, and the Northern Counties Railway joins Belfast and Londonderry through Antrim, and also runs to Larne.

**Chief Trading Centres.**—The internal trade of the British Isles is greater at the present day than at any other period. It is also greater than that of any other country. Each mining or manufacturing centre has

**IRELAND**  
Principal Railways & Canals.

The map illustrates the railway network and canals of Ireland. Key features include:

- Geographical Context:** The Atlantic Ocean is to the west, the North Channel to the north, and St. George's Channel to the south.
- Major Cities and Towns:** Labeled locations include Londonderry, Strabane, Omagh, Bundoran, Sligo, Boyle, Cavan, Dundalk, Drogheda, Navan, Balbriggan, Clifden, Castlebar, Westport, Roscommon, Ballinasloe, Galway, Ennis, Thurles, Maryborough, Kilkenny, Clonmel, Wexford, Carlow, Tralee, Charleville, Mallow, Kilkenny, Kenmare, Cork, Youghal, and Bandon.
- Railways:**
  - Great Northern Railway:** Connects Londonderry to Belfast and beyond.
  - Great Southern Railway:** Connects Dublin to Cork and beyond.
  - Great Western Railway:** Connects Dublin to Wexford and beyond.
  - Dublin, Wicklow & Wexford Railway:** Connects Dublin to Wexford.
- Canals:**
  - Grand Canal:** Connects Dublin to the west.
  - Royal Canal:** Connects Dublin to the north.
  - Sarsfield Canal:** Connects Dublin to the south.

A map of the St. George's Channel area. The text 'DUBLIN' is written vertically along the coast. 'Wexford' is written horizontally near the coast. 'St. George's Channel' is written diagonally across the water area.

its great trading town, where most of the business of buying and selling is carried on. Birmingham in the Black Country, Sheffield in the South Yorkshire iron district, Leeds in the woollen district, Manchester in the cotton district, Newcastle-on-Tyne in the northern coal and iron district, are the great commercial centres of industrial England. With the exception of Newcastle, these are all practically connected by a series of smaller towns. Cardiff is the commercial centre of South Wales. In Scotland, Glasgow, and in Ireland, Belfast and Dublin have become commercial capitals.

**London.**—London is a great central market, receiving commodities from all parts of the country and from abroad, and redistributing them both to home and foreign markets. Imported agricultural and food products of all kinds, such as tea, coffee, sugar, groceries, as well as all kinds of fancy goods and luxuries, are sent from it to other towns. In the same way coal, chiefly from the Midland coalfield, manufactured goods, jewellery, and hardware from Birmingham, cutlery from Sheffield, woollen goods from Yorkshire, and cotton goods from Lancashire, all pass through the wholesale London warehouses. Dairy, farm, and garden produce are brought from the country and the Continent to supply its great markets and feed its seven million inhabitants. Special fish and meat trains arrive during the night at the great London stations, loaded with food supplies, which are sold the next morning. The city and suburban traffic is carried on by the main lines of which it is the centre, and by two local lines, chiefly underground—the District and the Metropolitan.

The chief London markets are Billingsgate for fish ; Smithfield

and Leadenhall for meat, game, and poultry ; Covent Garden and Smithfield for fruit and vegetables. There is a Metropolitan market for home cattle, and a Deptford market for foreign cattle.

**Staffordshire.**—Birmingham manufactures large quantities of jewellery, and is the centre of a district which produces hardware of every description. These wares are sent to London—whence they are largely redistributed to the great northern industrial towns—and to Gloucester, Liverpool, and Hull for shipment abroad. Like London and all large manufacturing centres, it obtains its food-supplies from home and foreign sources, receiving daily supplies of the more perishable, for the quick transport and delivery of which special arrangements are made by the railway companies.

The Staffordshire potteries and the Burton breweries distribute their goods in the same way.

**South Lancashire.**—Cotton goods, the staple of South Lancashire, are consigned from the surrounding districts to Manchester, whence they are distributed to Liverpool, Hull, and other ports for shipment, and to all parts of the country for home consumption. The raw materials enter mainly by Liverpool or by the Manchester Ship-Canal ; and large quantities of food from foreign and colonial sources are consigned to Manchester by these routes.

Salt from the **Cheshire** mines and chemicals from South Lancashire are distributed to both the Lancashire and the Yorkshire manufacturing districts, as well as to other home and foreign centres.

**West Riding of Yorkshire.**—Leeds and Bradford serve as the emporia for the West Riding woollen centres, whose wares they distribute partly by rail and partly by sea, through the ports of Goole, Hull, and Liverpool.

Cutlery and armour-plates from Sheffield are distributed in the same way.

From Northumberland and Durham the North-Eastern Railway carries coal, iron goods, and chemicals to all the surrounding districts, and to Newcastle, Sunderland, Middlesbrough, and other ports.

The railways in the Lowlands of Scotland carry much coal to the ports for foreign trade in addition to distributing it to the inland parts of the country. The North British Railway distributes the woollen goods of the Tweed valley, and shares all the varied trade of the Glasgow district with the Caledonian Railway and the Glasgow and South-Western Railway.

**Ports.**—London is the port nearest the heart of the south-eastern region of England, and is opposite the great Continental ports, more particularly those at the mouth of the Rhine, with which a constantly active trade is carried on, not only from London, but from other ports on the east and south-east coast of England. The Continental packet stations, outports of London, are Harwich, Dover, Folkestone, Newhaven, Southampton, and Weymouth. Southampton has grown in recent years to be the port for great liners to the East and to Africa, and for London passengers to America. The western ports sprang into importance after the doubling of the Cape of Good Hope and the discovery of America. Bristol and Plymouth were the most important of these until the application of steam-power to industry and the rise of great manufacturing centres round the South Wales, Midland, Lancashire and Yorkshire coalfields raised Liverpool, in the west, and Hull, in the east, to the rank of first-class ports. Cardiff, Newport, and Swansea have grown with

the development of mining and metal-working on the South Wales coalfield. From early times Newcastle shipped coal to London; but the other Northumberland and Durham ports, North Shields, Tynemouth, Sunderland, together with Middlesbrough, in Yorkshire, have become important only in recent years with the development of coal and iron industries and the manufacture of chemicals. Silloth is the port for this region in the west, and south of it Maryport, Workington, and Whitehaven are outlets for the Cumberland coalfields.

In Scotland, as in England, the east coast ports were long the most important, and trade was carried on, more particularly with France, through Leith. Now Leith, Grangemouth, Burntisland, and Dundee still carry on an extensive coasting and Continental trade; while the Clyde has become the busiest commercial centre in Scotland. Greenock, Glasgow, and Ardrossan are the chief ports. Aberdeen sends out granite and manufactured goods.

The great ports of Ireland, such as Belfast, Dublin, Waterford, and Cork, are all in the east or in the south, nearest Britain and the Continent, and serve as outlets for the agricultural products and salmon of Ireland, and as inlets for manufactured goods from Great Britain. The east coast is not only nearest the richest land of Ireland, but is opposite Great Britain. The west coast of Ireland has numerous natural harbours; but a natural harbour alone does not suffice to make a port, which must have easy communication with land producing commodities for which there is a demand. The west of Ireland is chiefly pastoral, and is unable to support more than a coasting trade. Limerick,



which forms the outlet for the Golden Vale, is by far the most important port on the west coast.

The routes between Great Britain and Ireland are numerous. Scotland sends goods and passengers from Glasgow and Greenock to Londonderry, Belfast, and Dublin; and swift boats run daily between Ardrossan and Belfast, and between Stranraer and Larne, the latter the shortest sea-route between the two islands. The north of England ports, Barrow, Fleetwood, and Liverpool, do a large cross-Channel trade with Belfast, and also trade with the Isle of Man. Liverpool is also directly connected with Drogheda, Dublin, Cork, and other ports. The quickest service from London to Dublin is by the mail route *via* Holyhead to Kingstown or Dublin direct. Steamers also sail from Holyhead to Greenore for Belfast. Both New Milford and Bristol are in regular communication with Waterford and Cork.

All the ports of the British Isles have regular steam communication with each other every few days.

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## CHAPTER VI.

### OUR FOOD-SUPPLY.

IN olden times our country was dependent on its own products for the food of its inhabitants, who were forced to subsist on what could be grown in their own immediate neighbourhood. In bad years considerable distress was therefore felt, while actual famines were not unknown. The choice of food was also more limited than at present, and some districts offered less variety than others.

In the Tweed valley servants formerly stipulated for a clause in their contracts forbidding salmon to be served more than three times a week. Nowadays few masters feed their servants on salmon even three times a year. It is no longer the commonest

fare either in Tweeddale or elsewhere, but is a luxury within the reach only of the well-to-do. Its value has increased even in regions where it is abundant, while the value of other foods has fallen. No doubt salmon have become scarcer, but the change in relative value is in large part due to the development of transport facilities, which permit salmon to be forwarded to distant markets, and other kinds of food to be cheaply brought from other parts.

This increase in transport facilities is part of a general economic change which has come over this country during the last century and a half, transforming Great Britain into a great manufacturing country. The increased power of production resulting from the use of steam-power has led to an enormously rapid increase of population, especially in the non-agricultural section of the community. The home food-supply has not kept pace with this increase of population, and the bulk of our food now comes from the uttermost parts of the earth in great steamers which occupy only a few weeks on the voyage. Over £230,000,000 are spent annually on imported food.

Food products, using the term in the widest sense, may be divided into cereals, fish, flesh, dairy produce, fruits, and drinks. The cereal most in demand is wheat. It is long since the wheat-lands of Britain ceased to supply enough wheat for the people of the United Kingdom, and since the removal of the heavy duties once levied on foreign wheat the import of this cereal has gone up by leaps and bounds. At the end of the nineteenth century it was more than double the quantity imported thirty years previously.

The latter half of the nineteenth century has been marked by the colonisation and cultivation of many lands formerly occupied by wandering hunters or

herdsmen. The extension of the wheat-growing area has enormously increased the world's food-supply, and has created a surplus which is sent mainly to Europe, and very largely to the United Kingdom. The most important of these new wheat-lands are the North American prairies, west of the Alleghenies and the Great Lakes. In Europe, the *pusztas* of Hungary, the Wallachian plain, and the rich black lands of southern Russia are the great wheat-producing regions. All these regions are relatively sparsely peopled, and in some—for example, in Russia—rye and not wheat is the cereal consumed by the inhabitants themselves. There is consequently a large surplus for export to western Europe. In India excellent wheat is grown in the north-western regions under irrigation. The Plate basin in South America is another source of our wheat-supply, and its resources are as yet by no means fully developed. Australia sends irregular supplies—e.g. £1,500,000 in 1902, £10 in 1903. In addition to these wheat-lands there are two vast areas which, though as yet comparatively undeveloped, might be made to produce enormous supplies of wheat. These are the plains of western Canada and southern Siberia. Until these virgin lands are more or less exhausted, there will be a natural increase in the world's wheat-supply; but in a few decades a more careful and intensive cultivation of the wheat regions will be essential, as most of the available free land will doubtless in that time be fully utilised, even in the higher lands of Africa.

American wheat is sent east to the Atlantic ports, more particularly to New York, Boston, Montreal, and Quebec, by the great railways of the United States and Canada, and the Great Lakes and the canals which connect them either with the

Hudson or the St Lawrence. Much United States wheat is exported in the form of flour, ground largely at Minneapolis, on the Mississippi, at the foot of the great St Anthony Falls, which supply water-power for turning the numerous flour-mills. The finest flour is imported into this country from Hungary, and it is remarkable that this is superior to that ground in this country from Hungarian wheat. Hungarian wheat is exported partly from the port of Fiume on the Adriatic, but most of the Danube valley crop finds its way down the river to Braila and Galatz, near its mouth, where it is shipped westwards. Russian wheat is brought across the plain to Odessa, to Kherson at the mouth of the Dnieper, and to Taganrog at the mouth of the Don. Wheat is also shipped from the Baltic ports. Indian wheat is shipped mainly from Karachi; Australian from Sydney, Melbourne, and Adelaide; South American from the Plate River.

From 40 to 60 per cent. of our imported wheat and flour comes from the United States, nearly one-third of it as flour; 5 to 25 per cent. from Russia and from Argentina; and 10 to 12 per cent. from Canada, the most important of our colonial sources of wheat, and the source most rapidly expanding.

**Maize**, the cereal next in importance, is imported more as a feeding substance for our live-stock than for human food, though much is turned into corn-flour at Paisley and elsewhere. It comes chiefly from the central Mississippi basin, and is shipped at Chicago, New York, or New Orleans. Rumania and Argentina occasionally send as much as the United States.

The other cereals, more particularly barley, oats,\* and rye, and the pulses—peas and beans—are also largely imported. Barley is chiefly used for brewing and distilling, and is imported mainly from Russia, the Danube provinces, Asiatic Turkey, and the United

\* Oats come from the United States, Russia, and Canada, rye and peas from the United States and Canada, and beans from Asiatic Turkey and Egypt.

States. The other substances named are employed more for feeding stock than for human food.

**Rice**, the only other important cereal, is brought from Burma through Rangoon, and from Bengal.

**Dairy Produce and Eggs.**—Butter and margarine, cheese, eggs, and milk are important articles of food which our dairies and poultry-farms do not supply in sufficient quantity.

Butter is largely obtained from Denmark, Sweden, Holland, and the north of France, whence supplies can be delivered in British markets before they have time to deteriorate in quality. In recent years the introduction of refrigerating processes enables dairy produce to be brought fresh from the farthest regions, and Russian, New Zealand, Australian, and Canadian butter is now a common article in the English market. Cheese comes principally from Canada, where careful technical education has made the farmers of Ontario the most skilful cheese-makers in the world. Large quantities also come from the Northern United States. Cheese is also imported from Holland, Belgium, Switzerland, France, and New Zealand. Over £1,000,000 worth of eggs are annually obtained from Russia, Denmark, and Germany; and Belgium and France send large supplies. Considerable numbers come from Canada. Condensed milk is imported from Switzerland and Norway.

**Fish.**—The home supply of fish is very large, and more is exported than imported. Fresh herrings are brought from Scandinavia, other kinds of fresh fish from Norway and Holland, and oysters from the United States and France. Frozen salmon from Canada is becoming common in the markets of London and the

larger ports, and canned salmon, lobsters, and oysters are imported in large quantities from Canada and the United States. Sardines, preserved in oil, are imported from French and Portuguese fisheries, and anchovies, in oil or brine, are obtained from Italy and Norway. Both are luxuries rather than staple articles of food.

**Flesh.**—Meat is imported partly in the form of live animals, partly as dead carcasses, partly as salted or preserved meat. Live cattle are sent mainly from the United States, Canada, and Argentina, through New York, Boston, Montreal, Quebec, and Buenos Aires. From the same countries and from Australia and New Zealand large quantities of dead meat are brought over in ships fitted with refrigerating chambers. Sheep are imported from the Argentine Republic, the United States, Canada, and even from Iceland. Frozen mutton is brought from the Argentine Republic, New Zealand, and also from Australia. Fresh mutton is imported in considerable quantities from Holland. Fresh pork is imported from Holland and the United States. Bacon and ham come mainly from the United States and Denmark; a little from Canada. Beef and pork, salted or preserved in other ways, come mainly from the United States. Canned mutton is brought principally from New Zealand and Australia. Meat extracts are imported from Uruguay and Argentina.

**Poultry and Game** are brought from various parts of the Continent; dead rabbits from the Continent and from Australia. In the latter country they have long been a pest; but they are now killed for their flesh, part of which is canned, and for their skins.

**Fruits.**—In recent years, since refrigeration has rendered it possible to bring even the more delicate

fruits from distant parts of the world without deterioration, fruit has become a much more important article of diet in this country. Of temperate fruits the apple is the most important. The home supply is quite inadequate, and several million bushels are imported annually, chiefly from the United States, Canada, and Normandy, though the supply from Tasmania is increasing. Subtropical fruits are obtained from the Mediterranean countries. The most important are oranges, lemons, figs, grapes—either fresh or dried into raisins and currants—olives, almonds, and dates—the last from the borders and oases of the desert. Of tropical fruits the banana is most in demand. It is imported in immense quantities from the Canary Islands, the West Indies, and other countries lying between the tropics. The more expensive pine-apple comes from the same sources. The coco-nut is brought from various intertropical regions, but chiefly from the islands of the Pacific and Indian Oceans.

A large trade is done in fruits preserved in bottles and cans. Apricots, pears, and other fruits are bottled in France, and are finer in quality and higher in price than the many canned fruits imported from the Southern United States, California, the East Indies, and Australia. In addition to dried currants and raisins, dried prunes, plums, and Normandy pippins have long been in use, and dried pears and apricots have been put on the market within the last few years.

**Sugar.**—Sugar not only forms part of our daily food, but is also the medium in which most fruits are preserved. It is found in every plant, and most fruits are rich in it. Several plants, such as the sugar-cane, sugar-beet, sugar-maple, and sorghum, are cultivated

for the sugar they yield. The sugar-cane grows only in warm, moist regions, and is cultivated in every part of them. It was formerly the staple product of the West Indies, where it is still largely cultivated, as well as in adjacent lands like British Guiana. It is also grown in the East Indies and Queensland. Our chief supplies of cane sugar come from these countries (excluding Queensland). The West Indian sugar trade has suffered during the last century from the competition of beet sugar. The Napoleonic wars at the commencement of the nineteenth century deprived the continental European countries of West Indian sugar, and obliged them to depend on that obtained from the sugar-beet, which could be grown in Europe. This led to a great increase in the cultivation of this plant in the north of France and Germany, in Belgium, Bohemia, Austria-Hungary, and parts of southern Russia. The sugar-beet is rarely grown in this country, though the climate is suitable, and beet sugar (principally from Germany, France, and the Low Countries) forms about two-thirds of our imported raw sugar.

**Spices, Flavours, &c.**—In former times, when salted and dried foods were so largely consumed in winter, spices were relatively a much more important article of diet than now, though they are still largely used. From the East Indies, one of the chief spice-lands, come the nutmeg kernel and its covering layer the mace, the dried pepper-berry, the ginger-root, and the mustard-seed. Ginger is obtained from the East and West Indies, and mustard from Asia Minor. The bark of the cinnamon-tree is imported from Ceylon. Zanzibar exports the dried buds of the clove, and Jamaica the pimento or allspice. Vanilla, used for flavouring, is produced



by an orchid growing in India, Central America, and Mexico. Almond-oil is extracted from almond seeds. The only oil extensively used as a food is olive-oil from the olive drupe, the finest qualities coming from the south of France and Italy.

**Ice.**—Nearly half a million tons of ice are imported annually, chiefly from Scandinavia, for preserving and cooling food in summer.

*269* **Stimulants and Narcotics.**—Stimulants may be divided into aromatic drinks prepared by infusion and those obtained by fermentation. The former owe their stimulating property to the presence of alkaloids, the latter to that of alcohol.

**Tea.**—In the British Isles tea is the most important non-alcoholic beverage. It is made by infusing the dried leaves of the tea-plant, which grows well in regions with very warm and moist summers where the slope of the land is sufficient to ensure good drainage. Formerly nearly all our tea used to be imported from China; but in recent years the hills of Assam, Darjiling, and other mountainous parts of India, and the mountains of Ceylon, have supplied the greater portion of the tea used in this country. China tea was shipped from Hankou and the Yang-tse-kiang ports, and from Shanghai and Canton. India tea is shipped mainly from Calcutta, and Ceylon tea from Colombo. Tea is now grown in Natal, Java, and other regions with suitable climates, and might well be introduced into northern Queensland.

The consumption of tea is rapidly increasing in this country: 160,000,000 lb. were consumed in 1880, while the amount imported in 1903 was over 300,000,000 lb.

**Coffee** is an infusion of the roasted and ground berry of the coffee-plant, which, like cotton, but unlike tea, cannot stand any frost. Most of our coffee comes from the Pacific slope of Central America, British India, Colombia, Brazil, and the West Indies. Brazil and the Dutch East Indies, especially Java, are among the chief coffee-producing regions. Indian coffee comes from the south of that country; very little is now obtained from Ceylon. Coffee has also been introduced into British Central Africa, where a 'bean' of very fine quality is grown.

The consumption of coffee in the British Isles is diminishing, but a million cwt. are imported every year, of which about three-quarters is re-exported.

**Cacao.**—Cacao, commonly, but wrongly, called cocoa, is made from the 'nibs' or seeds of the cacao-tree, a plant of American origin which flourishes in Mexico, Central America, the north of South America, and the West Indies, and has recently been successfully introduced into Ceylon. The cacao of Ecuador is shipped from Guayaquil; that of Venezuela from La Guaira; that of Trinidad from Port of Spain. It is also exported from Brazil, Costa Rica, Nicaragua, Salvador, and Guatemala. The consumption of cacao is increasing.

The kola nut, from West Africa, yields one of the strongest of all non-alcoholic stimulants. It is used medicinally, and is rapidly passing into common use.

**Fermented Drinks.**—The alcoholic drinks fermented from barley have already been described (see page 61).

**Wine**, the fermented juice of the grape, is by far the most important alcoholic drink which is imported. Although the vine can be grown in the south of England and Wales, it is at present of no economic

importance, and wine is obtained chiefly from the vine-growing regions of France, more particularly from the south, where Cetto is the chief wine-port. Clarets are exported from Bordeaux, and Burgundies from the Saône valley. Wine is also imported from Spain (sherry), Portugal (port), Italy, Germany (Rhine wines), and Hungary. Algeria, in the north of Africa, and the Cape, in the south, both export wine. In recent years considerable attention has been paid to vine-growing and wine fermentation in Australia, more particularly in Victoria and South Australia. Californian wines are also now in the British market. The distilled liquor obtained from wine is brandy. The best brandies are made at Cognac, in the west of France, and in the Champagne region.

A portion of the spirits imported into this country is distilled in Germany from the fermented juice of the potato. Rum comes from the British West Indies and British Guiana. Fine liqueurs are prepared by the Benedictine monks in Picardy and those of Chartreuse in Savoy. Among many others too numerous to mention may be noticed Kirsch, distilled from the cherry, and Curaçoa, made in Holland from the outer rind of the Curaçao orange. Practically, every plant can be made to yield alcohol, and numerous fruits and plants are used for the purpose.

Tobacco and Snuff are made from the prepared leaves of the tobacco-plant, a native of America. The tobacco-leaf is rolled into cigars or cheroots, and in this form it is brought from Havana in Cuba, Manila in the Philippines, and from Mexico, Borneo, Burma, and southern India. Tobacco for smoking and snuffing is imported from the United States, several countries of

Europe, and the Levant. Much is imported in the form of dried leaves, which are manufactured into pipe tobacco, cigars, cigarettes, and snuff in our own country.

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## CHAPTER VII.

### IMPORTS OF RAW MATERIALS AND MANUFACTURED ARTICLES.

**Raw Materials for Textile Manufacture.**—Wool and flax are the only two fibres of textile importance grown in the British Isles, but the home supply of both is quite inadequate. Cotton, hemp, jute, and other vegetable fibres, and silk, camels' hair, and other animal fibres, are all of foreign origin.

**Wool.**—Most of our imported wool comes from the southern hemisphere, where the merino sheep has been introduced. The chief wool-producing regions are Argentina, South Africa, Australia (south of 20° S. lat.), and New Zealand. Argentina exports little wool used in this country, which is chiefly supplied from Australasia and South Africa. The Australian grass-lands are the drier downs south of the twentieth parallel. The wool, which is washed on the sheep-runs before being forwarded to the coast, is exported from the chief ports of the five colonies. In New Zealand the Canterbury plains in the Middle Island are exceptionally suited for sheep-rearing, although sheep are very numerous on the drier parts of the western mountains. In South Africa the dry Karroos supply scanty pasture. Cape Colony wool, however, is less in demand than Australian, largely

because it is exported uncleaned. Its heavier weight in this condition increases the cost of transport, and consequently its price, while the manufacturer has also to pay the cost of cleaning. This is true to an even greater extent of South American wools.

There are numerous minor regions of wool-supply. For instance, sheep-rearing is almost the only industry of the Falkland Islanders.

The hair of the goat is also used for making woollen goods, especially that of the Kashmir goat and the Angora goat of Asia Minor. The latter has been successfully introduced into South Africa, and its fine hair, known as mohair, is a valuable export from our colonies there. The hair of the camel and of the alpaca of the Andes is also used in the woollen manufacture.

600,000,000 to 700,000,000 lb. of wool are imported on an average every year, of which less than half is re-exported. The home production is less than 140,000,000 lb. The total amount of raw wool annually manufactured in the United Kingdom is over 500,000,000 lb.

**Flax.**—In addition to the flax grown in Ulster, lint fibre is imported, mainly from the Baltic, and especially from Russian ports. The finest flax, however, is produced in the south of Belgium, which sends one-fifth of our imports. We are also supplied from Holland. A considerable quantity of flax is produced in southern Russia, in northern Italy, and in western France, but is not brought to Britain. Nearly 100,000 tons are annually imported.

**Cotton.**—Two-fifths of the world's raw cotton is sent to be manufactured in the British Isles. Cotton consists of the fine hairs growing round the fruit of the cotton shrub, or tree, which is found everywhere

between the tropics, and also in subtropical regions. The hair is separated from the seeds by the process called ginning, and the 'cotton wool' is then packed into bales weighing about 440 lb. each. In the sixties about 10,000,000 cwt. of raw cotton were imported every year; but the quantity is now over 16,000,000 cwt., of which about 15 per cent. is re-exported.

The United States of America are by far the most important source of our cotton-supply, for three-quarters of the raw cotton of the world is grown there. The cotton-plant cannot flourish in regions where frost occurs, and while it does not require exceptionally great moisture, it needs long, warm summers to ripen the seeds. The south-eastern United States have a climate admirably suited for its growth, and in the sandy soils of Georgia and South Carolina plants producing the finest and longest fibres are raised. This is known as sea-island cotton, which has been introduced from this region into Egypt, Queensland, and different islands in the Pacific. The American ports chiefly engaged in shipping sea-island cotton are Charleston, Savannah, and Wilmington. A cotton with a shorter staple, known as upland cotton, is grown farther inland. This is largely shipped from the Gulf ports, such as Galveston, New Orleans, Pensacola, and Mobile.

The delta of the Nile, with its very dry air and abundant moisture derived from the river, is well suited for the growth of fine cotton; and Cyprus and other parts of the Mediterranean are equally good cotton lands. Much cotton is shipped to this country from Alexandria and Smyrna.

The black soil of the Deccan in India to the east of the Western Ghâts, where the summer rains are not excessive, yields rich crops, which are shipped chiefly from Bombay. Of the minor cotton-growing regions, Brazil is the most important. It ships its cotton from Rio de Janeiro and Pernambuco. Attempts are being made to increase the growth of cotton in British lands, especially in Africa, from which in time a large supply may be expected.

**Silk.**—Over 1,000,000 lb., about £750,000 worth, of raw silk is imported into the United Kingdom every year; £500,000 worth of husks and waste, and over £500,000 worth of thrown silk are also imported annually. Silk is obtained from the cocoon of the silkworm, which feeds on the leaves of the mulberry, oak, and other trees of China, Japan, the Mediterranean region, and other parts of the world. Most of our supply comes from France, China, and India.

**Jute.**—Jute is the coarse fibre obtained from the jute-plant, which grows only in the rich alluvial soils of warm, moist regions. The bulk of our supply, about 350,000 tons per annum, is grown in the delta of the Ganges. It is shipped from Calcutta in sailing-vessels, as its value is too small to pay for steam transport.

**Hemp.**—Hemp is widely distributed; but most of that used in this country is imported from Russia, Germany, and Italy. Manila hemp, the long fibre of a palm, is imported in very large quantities from Manila in the Philippine Islands. New Zealand produces a fibre known as phormium, or New Zealand flax. The agave of Mexico and Central America yields a fibre known as heniquen, or sisal hemp, used in the manufacture of twine, rope, &c.

The ramie or China grass is the fibre of a plant of the nettle family, grown in many warm lands.

**Other Raw Materials of Vegetable and Animal Origin.**

Palm-oil, from moist and hot West Africa, and the dried coco-nut, known as copra, from most Pacific islands and the sandy shores of the Indian Ocean, are imported for making soaps and stearine candles. Many trees in the wet jungles of intertropical regions exude a milky juice which when dry becomes elastic, and is known as india-rubber or caoutchouc. The Brazilian forests supply the best rubber. The port is Pará, at the mouth of the Amazon. Rubber is also imported from West Africa, and from the East Indies, through Singapore. A variety of plants growing on the borders of the desert exude juices which form gums and resins imported either for use as drugs or as the bases of varnishes, dyes, or compounds employed in tanning. They are chiefly brought from East Africa and Arabia.

**Substances imported for Tanning and Dyeing.**—Tannin, an astringent found in most tree-barks, is used for tanning hides into leather. Some barks are richer in tannin than others. Among those imported into this country are the bark of the hemlock-spruce from the United States, of an acacia from Australia, and of an oak from the Mediterranean, from the east of which region come the acorn-cups known as valonia, also used in tanning.

Vegetable dyes have become less important since the introduction of aniline dyes. Indigo, the most important, is extracted from the stems of a plant of the pea family, cultivated mainly in Bengal, which



supplies most of our indigo. Some is also brought from the West Indies and Central America. Cutch, or catechu, extracted from an acacia, is largely imported from India. Gambier, prepared from the young astringent leaves of a tree growing round the Strait of Malacca, and gamboge, a yellow viscid juice which exudes from the gamboge-tree of Cambodia and is collected in hollow bamboo stems, are imported from the Indo-China peninsula. The finest gamboge comes from Siam. Madder was formerly cultivated for making turkey-red; but alizarin, the colouring matter of this dye, is now obtained from one of the coal-tar products. Many dye-woods, such as logwood, come from Central America.

Of animal dyes, red cochineal is perhaps the most important. It is made from an insect which feeds on the cactus, and is obtained mainly from the Canary Islands. Mineral aniline dyes, made from coal-tar, are imported from Germany.

**Timber and Cabinet Woods.**—The forests of our country have long been exhausted, and nearly all the timber used in this country is imported.

Redwood and whitewood from the Baltic are used for all kinds of building purposes. The former is also employed in paving streets and for finer kinds of joiner-work, the latter for coarser carpentry. Yellow pine comes from Canada and the northern United States, and the beautifully-marked and resinous pitch-pine from the forests of the east of the Alleghenies. The great Douglas pines of British Columbia and Oregon, and the Californian redwood, are magnificent specimens of timber, being sometimes as much as three hundred feet in height. The former is used for making masts

and as both are free from knots, they are among the most valuable timber imported. Oak is brought both from the continent of Europe and from America, and the hard and durable teak is shipped from India, especially from Burma. Walnut from the south of Europe, the United States, and Canada, and mahogany from tropical America, are employed in high-class joiner-work and cabinet-making. Many other beautiful woods are imported for the latter purpose, mainly from tropical lands—for example, Brazilian rosewood; the satinwoods of the West Indies, southern India, and Ceylon; ebony from Ceylon; and bird's-eye maple from North America.

Much wood is imported in the form of pulp, mainly from Scandinavia and Canada. It is used for paper-making.

The bark of the cork oak, both raw and manufactured, is imported from Spain and Portugal.

**Furs and other Animal Products.**—Furs are largely imported for winter wear. Siberia, northern Russia, and Canada are the last great fur-preserves of the world. The ermine, fox, beaver, mink, and sable are among the animals hunted for their skins. The seal-fisheries of the Arctic seas employ a large number of vessels, and the skins fetch a high price. The whale-fisheries in the same waters are important for the value of the whalebone and blubber, the latter used for oil. Much of the catch of the Canadian and United States sealing fleets in the North Pacific finds its way to London, which is one of the great fur-markets of the world. The recent development of the bicycling trade has created a great demand for walrus-skins, which make the best

burnishers, and these fisheries will rapidly increase in importance in Arctic waters. The skins of the tiger, lion, leopard, and grizzly bear are prepared as ornamental and useful rugs. By far the largest number of skins and hides brought into this country are those of common animals, such as cattle, sheep, goats, and horses, to be converted into leather. These are chiefly obtained from the pastoral regions of Australia, North and South America, and South Africa.

Elephants' tusks, or ivory, are imported mainly from Africa, at a terrible cost of human life and suffering. The teeth of the hippopotamus and the walrus are also collected for the ivory market.

The feathers of the African ostrich are in great demand, and ostriches are reared now, not merely in South Africa and in Algeria, but also in Australia and Argentina.

The feathers of other birds are also imported for ornament, and those of the domestic fowls and of the eider-duck, the down of which is gathered from the islands of the North Atlantic and from Norway, are brought to stuff cushions, quilts, and other soft and warm articles.

Sponges are brought from the Mediterranean and from the West Indies.

#### **Imported Minerals.**

Besides the precious metals—gold, silver, and a small quantity of platinum—the common metals—iron, copper, tin, zinc, mercury, lead, and manganese—are the chief metals imported into the British Isles.

**Iron.**—Enormous as is the output of iron ore from British mines, it does not suffice for the numerous

furnaces of the United Kingdom, and between 5,500,000 and 6,500,000 tons of ore are annually imported, five-sixths from Spain. The red hematite iron ores of the north of Spain are shipped from Bilbao to South Wales. The black magnetic iron ores of Sweden are still largely used in making cutlery at Sheffield.

**Copper.**—The development of electrical engineering has led to a great increase in the use of copper, which is found in a pure state in some parts of Russia and near Lake Superior. About 250,000 tons are annually imported, the greater part either as ore, as partly refined ore known as regulus or copper precipitate, or as unwrought blocks. It is sent from the Sierra Morena, in Spain, through Huelva; from the Ookiep mines, in the west of Cape Colony, through Port Nolloth; and from the United States, Australia, and Chile. Copper-smelting is mainly carried on in South Wales (especially round Swansea), Lancashire, and Lanarkshire.

**Lead and Manganese.**—Between 220,000 and 230,000 tons of lead are imported annually. Most of the lead is obtained from Spain, Australasia, and the United States, where it is found as a sulphur-lead ore known as galena. **Manganese** comes from Russia, India, Chile, Brazil, and Turkey, mainly in the form of the black oxide, which is used for making manganese steel. Over 150,000 tons of ore are imported annually.

**Zinc.**—80,000 tons of crude zinc are annually imported from Belgium, Germany, and the United States; and between 30,000 and 40,000 tons of zinc ore from Italy and Greece, and in growing quantities from Tunis, Spain, and Australia.

**Tin.**—Over 35,000 tons of tin, in addition to 5000 tons of tin ore, are brought, three-quarters of it from

the Malay Peninsula, which supplies most of the world with this metal, through the port of Singapore.

**Mercury** is largely used for making alloys, called amalgams, and in the refining of gold. Nearly all is derived from Almaden, in the Sierra Morena in Spain. About 2,500,000 lb. are imported every year.

Many other minerals are imported in smaller quantities, to be used pure or in combination with other metals.

**Platinum** is obtained from the Ural Mountains. It is not acted on by the atmosphere or any single acid, and it is very ductile and malleable, but not easily melted. It is used in electrical and chemical works.

**Nickel**, used in making nickel steel, and alloyed with copper to form German or nickel silver, comes mainly from New Caledonia. It is found in the Sudbury mines near Lake Superior, in Canada, and in various parts of the United States, as well as of Europe.

**Sulphur**, used in making sulphuric acid, is brought from many volcanic regions, more particularly from those of Italy.

**Graphite**, or plumbago, forms the lead of our pencils, and is also used as a lubricator and polisher. Since the once-famous Cumberland mines were exhausted, it is imported from Ceylon, Germany, and the United States.

**Nitrate of Soda**, or Chile saltpetre, found in the desert regions of South America, is imported for fertilising purposes. For this purpose many phosphates are brought from the south-eastern United States, but they have to be treated with sulphuric acid before they are used.

The fireproof **asbestos** is brought from Canada and Italy.

Nearly 300,000,000 gallons of petroleum are brought to this country from the wells at Baku, east of the Caucasus, through the Black Sea ports of Batum and Poti, and from the Pennsylvanian oil-wells in the east of the United States.

**Asphalt** is obtained from the pitch-lake in Trinidad.

Both **silver** and **gold** are largely imported into this country, not merely for coinage, but for use in the arts. Gold is chiefly extracted from the so-called gold quartz. The quartz is first crushed, and then the gold is taken out by chemical or mechanical processes. It is also washed from alluvial sands formed by the decomposition of gold quartz. The west of North America, Australia, and South Africa are the principal sources of the gold imported into this country.

**Silver** is not usually found pure. Large quantities are obtained from lead-silver ores, in which it is found in small quantities. It is abundant in the Andes, Mexico, Nevada, and Montana in the United States, and in Australia.

**Precious Stones.**—Diamonds are found in South Africa, especially at Kimberley and in the Transvaal, and also in Brazil. Rubies and sapphires are brought from Burma and Ceylon.

Pearls are the only precious stones of organic origin, with the unimportant exception of coral. They come from the Persian Gulf, Ceylon, the Sulu Archipelago, and the coasts of New Guinea and Northern Australia.

#### **Manufactured Articles Imported.**

Many manufactured articles are brought into the United Kingdom in spite of the great activity of its factories. Some of these, such as Turkey carpets or

Sèvres porcelain, are fine articles brought from regions specially famous for their manufacture. Others are common articles which other countries can put cheaply on our market. Many partially manufactured goods, such as cotton, woollen, and linen yarns, are sent to Britain for further elaboration.

A considerable proportion of these imported manufactured articles is immediately reshipped to our colonies and other lands with which we trade.

Cotton piece-goods to the length of over 40,000,000 yards, or 23,000 miles, are brought to this country every year, and about 75,000,000 yards of woollen cloths and stuffs. Many of the imported fabrics are of very fine quality and design. The woollens come mainly from France, where the finest qualities are made, and from Germany.

Both woollen and cotton goods are introduced in a further stage of elaboration, as hosiery and other articles of dress.

We spend on an average £5,300,000 per annum on imported manufactured cotton goods, and £9,500,000 on imported manufactured woollens, including carpets.

Most of the silk used in this country is manufactured abroad, in France, Germany, or Italy; and over £13,000,000 are annually paid for manufactured silk brought into this country.

Paris and Berlin supply mantles and many other articles of clothing, the French imports being remarkable for elegance and the German for cheapness.

Over £8,000,000 are spent every year on prepared leather, and £900,000 on boots. About 20,000,000 pairs of gloves are annually imported from Paris, Grenoble, Brussels, and Copenhagen.

**Lace**, buttons, studs, and much haberdashery are brought from the Continent.

Many articles of household use are also imported. China, porcelain, and earthenware are brought from the great Continental potteries at Limoges and Sèvres.

Kitchen utensils and tin-plate ware are largely obtained from the United States; cheap cutlery from the same country and from Germany.

Germany supplies many of the chemical manufactures; glass is brought from Germany, Bohemia, and Belgium; paper from Scandinavia, Germany, and U.S.A.

Many scientific instruments are also of German and French manufacture. £1,400,000 are spent annually on musical instruments, brought chiefly from Germany.

Cheap wooden matches are imported from Sweden, and wax ones from Belgium.

About £1,000,000 are spent every year on watches, and £500,000 on clocks, of foreign manufacture.

The growth in our imports of **manufactured iron** is one of the most remarkable phenomena in recent years. Over £8,000,000 are spent on foreign manufactured iron, not much under one-third of the value of our exports. Much of this comes from the United States, Belgium, and Germany. Nearly £2,000,000 were spent on motor-cars and cycles in 1903.

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## CHAPTER VIII.

### EXPORTS.

**Exports and Imports.**—The trade relations of this country are very complex. Britain plays the part of a great middleman, acting as an agent between buyers



and sellers in all parts of the world. It trades not merely in its own surplus produce—raw and manufactured—but in almost every article of colonial and foreign produce—raw and manufactured—in which a profitable trade can be done. An immense number of commodities, therefore, are imported only to be re-exported at a profit, chiefly through London. The existence of this entrepôt trade, as it is called, must always be borne in mind in studying lists of our imports and exports.

**Home and Foreign Produce.**—With the exception of coal, most of our raw exports are first imported. Cotton, wool, the skins of sheep and other animals, tallow and animal fat, india-rubber, and many other forms of raw produce, as well as large quantities of food-stuffs, which are included among our exports, are all of foreign origin. On the other hand, manufactured articles, which figure so largely among our exports, are chiefly, though not exclusively, of home origin.

**Mineral Exports—Raw and Manufactured** (chiefly of Home Origin).—Coal is by far the most important mineral exported, amounting in value to one-fifteenth of the total exports of the country. About 45,000,000 tons, or 18 per cent. of the total output of British mines, were exported in 1903, and 36,500,000 tons in 1898. Large quantities are sent to countries bordering the North and Mediterranean Seas, which have little or no coal of their own, such as Scandinavia, Finland, Denmark, Holland, Spain, Portugal, Italy, and Egypt, and to those parts of coal-producing countries, such as Germany, France, and Russia, which are more cheaply reached by boat from Britain than by rail from the

home collieries. Welsh coal is sent all over the world, and supplies the coaling stations for the British navy as well as the vessels themselves.

Between 15,000,000 and 17,000,000 tons of coal are shipped for the use of steamers engaged in the foreign trade, and are not usually reckoned among exports proper.

Iron is exported in many different forms. The quantity of simple pig and puddled iron averages over 1,000,000 tons per annum. Railroad plant of all kinds is sent to nearly all the countries of the world, more particularly to European countries and to the East Indies. It amounted to 720,000 tons in 1902 and 1903.

Tin plates and galvanised iron sheets together average annually about 650,000 tons.

Cast and wrought iron, unwrought steel, hoops, sheets, boiler plates, wire, bar, angle, and rod iron, are among the other forms in which this metal is exported, to a weight of about 800,000 tons per annum.

The total weight of iron and steel and manufactures thereof exported in 1903 was over 3,500,000 tons, valued at nearly £30,500,000.

Iron is the principal constituent of such exports as cutlery, hardware, and tools, of which more than £4,500,000 worth are annually exported; of cycles and motor-cars, £1,200,000; of locomotives, agricultural and other steam-engines, in 1903, £5,250,000; of textile, agricultural, and other machines and implements. The total amount of all machinery and mill-work exported, including steam-engines, averaged about £19,000,000 between 1901-3.

Among **miscellaneous** exports included under the head of metals, the most important are wrought and

unwrought copper, brass, lead, tin, zinc, telegraph apparatus of all kinds, electroplate, small firearms, guns and ammunition, clocks and watches, and others too numerous to mention.

The total exports of metals and articles manufactured from them, including ships, averaged over £67,000,000 in 1901-3, or approximately one-fourth of the total exports of British origin.

**Textile Exports** (chiefly of Home Manufacture).—Our textile exports are numerous and valuable. Cotton yarns and manufactured goods make up more than one-quarter of the total exports of this country, and woollen yarn and manufactures nearly one-tenth, the exact quantity varying from year to year. Over 5,000,000,000 yards, or 2,750,000 miles, of cotton piece-goods, nearly half unbleached, are exported annually to all parts of the world, especially to the hotter regions, such as Mediterranean lands (more particularly Egypt and Turkey), the West Indies, South America, West and Central Africa, India, the East Indies, China, Japan, and Australia, which are our chief customers for these commodities. These cotton piece-goods were worth over £55,000,000 in 1903. If the cotton yarn, exported mainly to European countries (Germany, Holland, Turkey), British India, and Japan, be added, the total cotton manufactures we export are valued at over £73,000,000 on the average of the three years 1901-3.

About 90,000 miles of woollen and worsted goods, about 9,000,000 yards of flannel, and 800,000 pairs of blankets are exported annually. The woollen trade is mainly with the cooler countries of the world, more particularly with European countries (especially

France, Belgium, and Germany), the United States and Canada, Australasia, Argentina, and Japan.

The hostile tariff of the United States has lately diminished the export of woollen goods to that country. Woollen and worsted tissues exported to the United States in 1896 were worth £3,500,000; in 1898, £1,000,000; in 1903, £1,400,000. The total woollen manufactures of all kinds, including yarns, exported in 1901-3 averaged £23,500,000—in 1903, £25,400,000.

Approximately, 90,000 miles of linen goods are exported, composed chiefly of white or plain linen. About 3 per cent. consists of sailcloth and sails.

The chief markets for linen goods are the United States (which takes about half of the total), Australia, Germany, Canada, and France. The annual value of linen goods exported averaged £5,350,000 in 1901-3.

Between 2500 and 3000 miles of silk stuffs are annually exported. Twist or yarn goes chiefly to the United States, Germany, and France; broadstuffs of silk or satin to France; handkerchiefs and shawls to India. The United States and our colonies receive all kinds of silk goods. The total exports are worth over £1,400,000.

Over 120,000 miles of jute piece-goods are exported to the United States, Argentina, Canada, and other countries. Over half of the jute yarn exported is sent to Brazil. Jute articles, excluding bags, were exported to the extent of over £2,100,000 per annum in 1901-3.

A large number of miscellaneous textile articles are exported, including cotton and linen thread for sewing purposes, lace, hosiery, carpets of wool and jute, and many others.

The total value of the textile articles exported averaged nearly £99,000,000 per annum in 1896-98, and nearly £108,000,000 per annum in 1901-3.

**Miscellaneous Manufactured Articles** (chiefly of Home Manufacture).—A large trade is done in **chemical products** (alkalies, bleaching materials, manures, and medicines), amounting to about £11,500,000 per annum; in glass and earthenware, to about £3,100,000 per annum; and in paper and paper articles, to £1,700,000 per annum.

Rubber goods worth £1,300,000 are annually exported; leather, unwrought and wrought (boots, shoes, and saddlery, &c.), to £4,500,000 worth per annum; furniture, haberdashery, millinery, books, and many other articles are sent abroad in large quantities.

**Raw Produce for Manufactures** (chiefly of Foreign Origin).—In addition to coal, iron, and other ores, which have already been mentioned, a large export trade is done in textile raw materials. Of these **wool**, in all its forms, is by far the most considerable, averaging in value £10,000,000. From 6,500,000 to 7,800,000 sheepskins and about 2,500,000 cwt. of wool are exported annually, chiefly to France, Germany, the United States, and Belgium. Imported **cotton** (average, 2,300,000 cwt.), dressed and undressed **flax**, and **hemp** are also exported in large quantities. **Caoutchouc** and **gutta-percha** have grown in recent years to be among the chief articles of our entrepôt trade, averaging over £4,000,000 worth in 1901-3.

**Food Exports** (chiefly of Home Origin).—The export of **fish**—one of the few natural products which this country exports—is very large. Over 2,050,000 barrels of herrings were sent abroad annually in 1901-3,

worth £2,550,000. Our largest customers for fish are those countries where the use of flesh is forbidden on religious grounds at certain seasons, such as Germany, Russia, and the Roman Catholic countries bordering the Mediterranean.

**Live-stock** is in considerable demand abroad, chiefly for breeding purposes. Of live-stock used for food, sheep are the most important; but the number exported is less than that of horses, which are largely exported to Belgium.

Of **vegetable** home-grown exports, the potato is the most important, the quantity exported varying from year to year with the size of the crop. In 1898 only about 194,000 cwt. were exported and in 1894, 1,073,000 cwt.

Our food exports include colonial produce of all kinds; cereals, such as maize, wheat, wheat-flour, and barley, to which may be added 250,000 cwt. of biscuits and cake, and a growing quantity of confectionery; foreign beef and pork; dairy produce and eggs. Colonial produce is the most important.

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## CHAPTER IX.

### THE GREAT TRADE-ROUTES FROM THE BRITISH ISLES.\*

FOR an island country, such as Britain, transport by sea is all-important, bringing it into contact with all the maritime countries of the world. We have seen that much of our raw material and food is imported, and that we are dependent upon foreign

\* See map on page 188.

markets for the sale of our surplus manufactures. It is, therefore, important to understand the main sea-routes and the principal commodities carried over them.

### **The North Sea and Baltic Trade.**

When population and manufactures were concentrated in the south-east of Great Britain, the greater part of our trade was with the ports on the opposite side of the English Channel and the North Sea, more particularly between the Thames and the Rhine ports. In modern times the North Sea trade is still very valuable; it is carried on from all the east coast ports, more particularly from London, Harwich, Grimsby, Hull, the north of England ports, and from those of the Forth. The North Sea trade may be divided into two kinds, the mainland and the Scandinavian trade. The mainland trade is with France, Belgium, Holland, and Germany; the chief ports being Dunkirk (Dunkerque) in France, Antwerp (Anvers) in Belgium, Rotterdam and Amsterdam in Holland, Bremen and Hamburg in Germany—much of whose trade also goes through Holland and Belgium. The Scandinavian trade is largely with Bergen, Kristiansund, Kristiania, and Drammen. The chief exports to the mainland are cotton and woollen yarn and manufactures, coal, metals, and machinery—the Humber ports doing the largest trade.

From Belgium we receive cotton, silk, woollen, and linen goods greater in value than our exports to these countries; also flax, glass, iron, zinc, sugar (both refined and unrefined), eggs, and dairy produce. From Holland we obtain butter, margarine, cheese, fresh and preserved meat (especially mutton), sugar, and colonial

produce, such as cacao and rice. We import much German, Austrian, and Swiss produce through Holland and Belgium, notably silk, sugar, clocks and watches, glass, gloves, wine, condensed milk, toys, and aniline dyes.

To Norway the chief exports are cotton, woollen, and metal manufactures, and coal, in return for which we obtain timber, wood-pulp, paper, fish, ice, and condensed milk.

A large passenger trade is carried on from Harwich to the Hook of Holland (Hoek van Holland), Rotterdam, and Antwerp; from Queenborough to Flushing (Vlissingen); from Dover to Ostend; and in the summer months also from Tilbury to Ostend.

The Baltic trade is with regions having large areas of forest and agricultural land, but little coal or other minerals, except the iron of Sweden.

Navigation is interrupted from three to five months every winter, owing to many of the harbours being ice-bound. The waters of the Baltic are only one-quarter as salt as those of the ocean, and freeze more easily, although the whole sea is but rarely completely covered with ice. The use of ice-breaking steamers in recent years has helped to keep the Baltic navigable. Several canals unite the North and Baltic Seas. By far the most important is the Kaiser Wilhelm Canal between Brunsbüttel, near the mouth of the Elbe, and Holtenau, near Kiel, which is large enough to admit ships of all sizes. This canal saves about 240 miles (twenty hours) on the journey from London to Baltic ports other than Danish, 180 miles (fifteen hours) from the Humber, and over 100 miles (nine hours) from the Tyne ports. From the Ferth, the old route by



the Skager-Rak and the Kattegat is as short, but its navigation is much more dangerous. Copenhagen (Kjöbenhavn) on the Sound, is the great commercial centre of the Baltic trade. Coal, metal, and manufactured goods of all kinds are sent thither, and Danish butter, bacon, and eggs are shipped to Britain.

Coal, metals, textile fabrics, and machinery are the chief products sent to the Baltic ports, the cold climate creating a greater demand for woollen than for cotton fabrics. In return we obtain timber, wood-pulp, iron, butter, paper, and matches from Sweden through the ports of Göteborg (usually written in English, Gothenburg), Malmö, Norrköping, and Stockholm. Timber, cereals, flax, hemp, linseed, oil-seed cake, and butter are imported from Russia through St Petersburg, Riga, and Revel. From Germany, through Memel, Königsberg, Stettin (with Swinemünde as its deep-water harbour), and Kiel, we get timber, butter, and some manufactured and chemical goods; but most of these pass through the North Sea ports.

#### The European Atlantic Trade.

A very large proportion of British trade between the British Isles and the Continent is carried on across the English Channel, between Dover and Calais, Folkestone and Boulogne, Newhaven and Dieppe, Southampton and Le Havre, Weymouth and St Malo. A large part of the trade between London and Paris is carried on by direct shipment from London to Le Havre or Rouen on the Seine, and steamers regularly ply between London and Paris. A considerable trade is also carried on between the coalfields of South Wales and the north of England

and the ports in the north of France. The latter also trade with Liverpool.

Trade with the Bay of Biscay and the coast of Portugal and Spain is actively carried on through all west coast ports, more particularly between Liverpool and Bordeaux. Bilbao, Santander, and other ports in the north of Spain send unsmelted and partially smelted ores to the South Wales and Lancashire furnaces. The clarets of Bordeaux are shipped direct to London, Leith, and Liverpool. From Oporto and Cadiz respectively come port and sherry wines; from Lisbon, olives, oranges, and other fruits; from Huelva and Cadiz, copper, manganese, and other minerals from the Sierra Morena, as well as cork, fruit, and other products of Andalusia. Coal, metals, and manufactured cottons are sent in exchange, chiefly from Liverpool, London, and the coal exporting ports of northern England and Scotland.

#### The Mediterranean Trade.

The Mediterranean, like the Baltic, is a sea with few coalfields near it, those of the south of France being comparatively unimportant. The forests of the Mediterranean have been nearly all cleared, so that wood is not available for fuel as in the case of the Baltic. Consequently a large trade in coal is done with the Mediterranean ports, chiefly for industry and transport, as the southern climate greatly reduces the domestic consumption.

The Mediterranean is not the seat of very great industrial activity save in the valleys of the Ebro, Rhone, and Po, and manufactured goods, more particularly cottons, linens, and light woollens, are among

the articles chiefly in demand. In exchange for these commodities, our ships bring back subtropical fruits—oranges, lemons, figs, olives, grapes, and also dates from the borders of the desert. Minerals are almost entirely obtained from the south of Spain. A large trade in cereals passes through the Mediterranean from the Black Sea ports.

To protect our commerce in the Mediterranean and to guard the route to India, Britain possesses three stations in the Mediterranean: Gibraltar, on the Spanish mainland in the west, guarding the strait of that name; the island of Malta, commanding the passage between Sicily and Africa; and Cyprus, protecting the eastern Mediterranean. Since 1882 Egypt has been under British control. This is jealously viewed by our Continental neighbours, owing to the importance of the Suez Canal as an international highway.

**Spanish Trade.**—From Malaga, Almeria, Cartagena, and Valencia in the south of Spain, grapes, raisins, wines, oranges, lemons, almonds, and copper, mercury, and other minerals from the Sierra Morena, are sent to this country, which in return exports coal, metal goods, and textile manufactures. Barcelona, to the north of the mouth of the Ebro, is the port for the rich lands of Catalonia, carrying on a trade with Britain similar to the southern ports.

**French Trade.**—Cette, in the south of France, is the great wine port of the Mediterranean. Marseilles is the commercial outlet for Provence and the Rhone valley. It lies east of the Rhone delta, the shallow distributaries of that river not being navigable for large vessels. Wine and olive-oil are exported to

this country, coal and metal goods being taken in return.

**Italian Trade.**—Genoa (Genova), Leghorn (Livorno), and Naples (Napoli) receive large quantities of coal from South Wales, Newcastle, and Scotland; fish from Scotland and from the south-west of England; engines, railway plant, and metallic goods. Through Genoa itself we import little, our trading-vessels going farther east for their return cargo, to the Levant, to the *Ægean* and Black Seas, or to Algiers. The transporting of coal and other commodities from Britain is passing into the hands of Italian shippers. From Naples olive-oil, marble, wine, hides, and hemp are obtained in return. A considerable trade is done with the ports of southern Italy, more particularly with Palermo and Messina, which take cotton, woollen, and metallic manufactures, and coal, in exchange for wine, oil, southern fruits, and sulphur.

**Adriatic Trade.**—From Venice (Venezia), the centre of a considerable Adriatic trade, our ships bring back little, usually leaving the harbour loaded with ballast, to take in wheat, flour, and wine at Trieste and Fiume, the ports of Austria and Hungary respectively.

**Greek Trade.**—Valonia and currants are the chief exports of Patras and Piræus, which receive industrial produce in exchange. The Corinth Canal, across the isthmus of that name, saves the long journey round the south of the Morea. Syra, or Hermopolis, is the coaling station and chief port of the Grecian Archipelago, and exports emery and iron ore.

**Turkish Trade.**—From Salonica (Slavonic, Saloniki; Turkish, Selanik) cereals, tobacco, wool, and opium

are obtained. Constantinople (Turkish, Stambul), on the Golden Horn, is one of the most important commercial cities in the world. Lying between the Black Sea and the Mediterranean, and between Europe and Asia, it is the market through which the products of two seas and two continents are exchanged. Manufactured goods of all kinds are sent out from Britain in vessels which return with Turkey carpets made by Armenians, mohair, wool, and opium.

**Danube Trade.**—From the Danube ports, more particularly Sulina, Galatz, Braila (or Ibraila), and Varna, the cereals of the Hungarian and Wallachian plains are shipped.

**Russian Black Sea Trade.**—Cereals and flour are the chief products obtained from Odessa, Kherson, and Taganrog, the principal ports of southern Russia. From Batum, in the east of the Black Sea, petroleum-oil from Baku in the eastern Caucasus is exported.

**Asia Minor Trade.**—Trebizond distributes most of the imports intended for Asia Minor and Persia, and collects much Persian produce, more particularly silk and woollen, for export to this country.

Smyrna, the great port of Asia Minor, receives from this country manufactured articles of all kinds—metal and textile, chemical and leather. Sultana raisins, barley, beans, figs, olive-oil, valonia, gall-apples, drugs, cotton- and other seeds, and tobacco are among the most important exports.

**Syrian Trade.**—Beirut (Beyrout) and Jaffa, the chief ports of Syria, send wool to America by Liverpool; but the chief trade is in fruit.

**Egyptian Trade.**—From Alexandria the products of Egypt—cotton, cotton-seeds, sugar, beans, onions,

cigarettes—together with gums and ivory from the Sahara and the Sudan, are shipped.

**North African Trade.**—Bengazi and Tripoli trade in gums and other products, brought across the desert, and, in common with Tunis, Algiers (Alger), and other ports in northern French Africa, export esparto grass (for making paper) and barley. Algiers also exports iron ore. In return we send coal, cottons, and metal goods.

#### **Extra-European Atlantic Trade.**

The Atlantic trade may be divided into the North American trade, the trade with Central America and the West Indies, the Guiana and Brazilian trade, the Plate trade, the West African trade, and the South African trade.

The North American Atlantic trade is of great importance to Britain. Not merely do we get the greater part of our food-supply from the United States and Canada, but a very large proportion of our manufactured goods are sent to these countries. The St Lawrence ports, Quebec and Montreal, are closed in winter by ice, and the traffic is then diverted to Halifax, St John, Portland (Maine), Boston, and New York. With the last two ports, together with Philadelphia and Baltimore, a very large proportion of our trade with the United States is carried on. From Halifax and St John, cereals, flour, cattle, meat, timber, cheese and other dairy produce; and from the United States ports, iron goods in addition, are sent in return for every kind of manufactured article. High tariffs and the steady development of American industries are tending to reduce the importance of our exports to

the United States, while the preferential tariff granted by Canada to the mother-country serves to foster our trade with that colony. Wilmington, Charleston, and Savannah send us sea-island cotton, as well as pitch-pine, turpentine, and resins from the forests of the southern Appalachians. Pensacola, Mobile, New Orleans, and Galveston are the chief ports on the Gulf of Mexico, from which we obtain raw cotton, cotton seeds and oil, tobacco, wheat and meal, sent down the Mississippi to New Orleans.

**Central American Trade.**—Manufactured goods are the chief exports to Vera Cruz, the principal port of Mexico, from which metals (more particularly silver), mahogany, and cigars are brought. Belize, in British Honduras, and Bluefields, in Nicaragua, export mahogany and other fine woods from the wet and densely-forested eastern regions of Central America; but most of the trade of this region is carried on from the Pacific ports which are on the side of the isthmus best situated for agriculture and trade. When the Nicaragua or Panama Canal is cut these ports will be brought much nearer Britain.

**West Indian Trade.**—The West Indies exchange sugar and tropical fruits for manufactured goods of all kinds. From Havana, in Cuba, we get tobacco and cigars; sugar, molasses, and rum from Kingstown in Jamaica; cacao from Port of Spain, which also exports the asphalt of the Trinidad pitch lake. Barbadoes is the British shipping centre for the Lesser Antilles.

**The Guiana and Brazil Trades.**—From La Guaira, the port of Caracas, the capital of Venezuela, and the other ports in the north of South America cacao is the chief export. Sugar is principally brought from George-

town, on the Demerara River in British Guiana. Cacao is also shipped from the north of Brazil; but the chief trade of that district is in india-rubber, which is shipped from Pará, at the mouth of the Amazon. It is also shipped from Manaoes (situated where the Rio Negro joins the Amazon), Pernambuco, and Bahia, the latter the second port in Brazil. These ports also send coffee, sugar, cotton, rosewood, hides, and diamonds. The great centre of Brazilian trade is Rio de Janeiro, from which all these articles are exported. Santos, farther south, is the outlet for the rich coffee district of São Paulo.

**The Plate Trade.**—Monte Video and Buenos Ayres are the chief ports on the Plate estuary, from which wheat, maize, and other cereals, cattle, sheep, wool, and hides from the Plate basin, are exported in return for coal, chemicals, textile and metal goods.

The West African trade is almost entirely in cotton and metal goods and spirits, the latter usually of the vilest description. These are sent to Freetown, Akra, Lagos, Akassa, Bonny, and other ports on the Gulf of Guinea, from which india-rubber, palm-oil, oil-yielding nuts, and ivory are exported. The opening of railways is facilitating trade, and hopes are entertained that much raw cotton may be obtained from this region.

To South Africa we send out clothing of all kinds, metal goods, machinery, leather, cotton and woollen goods, paper and stationery, furniture, carriages, and in fact all manufactured articles required either for domestic or industrial purposes. In return we obtain diamonds, gold, copper, wool and skins (both of the sheep and the angora goat), hides, and ostrich feathers. Capetown, Port Elizabeth on Algoa Bay, East London,



Durban on Port Natal, and Lourenço Marques on Delagoa Bay are the chief ports for the trade of South Africa.

### **Indian Ocean Trade.**

The trade of the Indian Ocean was formerly carried on round the Cape of Good Hope; but since the opening of the Suez Canal the shorter route is generally taken by steamers. The trade carried on across the Indian Ocean may be divided into East African, Arabian, Persian, and the Indian and Ceylon trade.

The **East African trade** is still carried on by both routes. The principal southern ports have been already dealt with. Zanzibar is the great trade-centre of East Africa. From the island itself the chief export is cloves; but much of the ivory and rubber brought from the interior to Vitu, Mombasa, and Dar-es-Salaam is sent to Zanzibar; but Mombasa, connected by railway with the Victoria Nyanza, is the most important. Trade is carried on at the mouth of the Zambesi with the Shire Highlands, part of the British Central Africa Protectorate, where coffee has been cultivated in recent years, and rice, tobacco, cotton, and tea can be successfully grown. Trade with **Madagascar** has diminished since the island became a French possession. From Mauritius, the Seychelles, and other islands sugar is the chief export.

The **Arabian trade** is mainly in gums. These are exported through Jedda and Aden (the latter a British possession guarding the entrance to the Red Sea). Wool, carpets, hides, dates, shells, opium, and gums are among the chief articles exported from the **Persian Gulf**, mainly through Bushire, on the coast and Basra,

in Mesopotamia. Dates, gums, and a small quantity of goats' and camels' hair come from the Arabian steppes through Persian Gulf ports.

**Indian and Ceylon Trade.**—India is a very important market for our manufactures, sending us in return both raw materials and manufactured articles of every kind.

Karachi, the port of the Indus, exports wheat, oil-seeds, wool, cotton, and hides; and imports large quantities of railway plant for the rapidly increasing network of lines.

Cotton and cotton yarn, oil and oil-seeds, wheat and other cereals, opium, leather, gums, and tea are sent to this country from Bombay. In return it takes chiefly cotton goods and machinery, railway plant, metal goods of every kind, and manufactured articles for distribution to western and central India.

From Colombo, in Ceylon, are brought all kinds of tropical products, more particularly tea, cacao, quinine, spices such as cinnamon, coco-nuts and copra, areca-nut, tobacco, and vegetable ivory. The export of coffee, formerly very important, has declined owing to the destruction of the plants by disease.

Madras does a large export trade in raw cotton, coffee, seeds, indigo, leather, Palmyra palm sugar for brewing and for fattening cattle, oil, coco-nuts, copra, tobacco, and hides, especially goatskins.

Much of our Indian trade passes through Calcutta. Jute is exported to Dundee both from this port and from Chittagong in sailing-vessels, which double the Cape of Good Hope. Tea, rice, wheat, indigo, some rubber, raw hides of cattle and goats, gunny sacks, and linseed are other important articles brought from Calcutta to this country.

Rangoon distributes the produce of Burma, including rice (which is by far the most important), catch, teak, and precious stones such as the ruby.

### **Pacific Trade.**

There are three routes from the British Isles to the Pacific Ocean: by the Suez Canal and the Indian Ocean, by the Cape of Good Hope and the Indian Ocean, and by Cape Horn. The Panama Canal when completed, or the railway across the isthmus of Tehuantepec, greatly shortens the distance to many Pacific ports, more particularly to those on the west coast of America. It has also been proposed to avoid the long journey round the south of the Malay Peninsula by cutting a canal across the isthmus of Kra.

The Pacific trade may be divided into the East Indian trade, the China and Japan trade, the North American trade, the tropical American trade, the South American trade, and the Australian trade.

The East Indian trade resembles the West Indian in many respects. The intertropical islands of eastern Asia are rich in forest products, yielding fancy timbers and dye-woods, juices such as guttapercha, and fibres such as Manila hemp. Tin, spices, sago, sugar, guttapercha, rubber, catch, gambier, and fruits are exchanged for cotton goods and hardware.

Singapore, on an island of the same name at the southern end of the Malay Peninsula, is the natural centre for the western ports of the East Indies, and a port of call for ships passing through the Strait of Malacca. Local trade is mainly in the tin of the Malay Peninsula; but all East Indian products are brought to Singapore for transshipment.

Batavia, on the island of Java, occupies a similar position with regard to the southern part of the group in the Sunda Strait. It is the capital of the Dutch East Indies, the rich produce of which is brought to Batavia for shipment to Europe. Amboina, in the Moluccas, is the centre of the spice islands.

Manila, on Luzon, the largest of the Philippines, is the northern centre of the East Indies. Under United States control it is growing rapidly in commercial importance. Ships sailing to the China Sea can seek the shelter of Luzon during the North-east Trades, and it also lies on the direct route between Hong-kong and Australia. Sugar, cheroots, and Manila hemp are the chief articles exported from the Philippines, in addition to ordinary East India produce; but the resources of these valuable islands are still practically undeveloped.

From Bangkok in Siam ships bring back teak, rice, and tin.

**China and Japan Trade.**—The populous countries of eastern Asia are excellent customers, taking more particularly large quantities of cotton goods and hardware.

The trade of China should develop considerably with the opening up of the country by railways and the use of steamers on the Yang-tse-kiang and other navigable waterways. China will be a customer not merely for the cottons and hardware which form the bulk of the trade at present, but a great importing centre for railway plant, machinery, and metal manufactures of all kinds, to be utilised in the building of new railways and factories.

Hong-kong, a British island at the mouth of the

Si-kiang, in close communication with Canton, the great southern port of China, is the outlet through which about 45 per cent. of the foreign trade of China is carried on. From Hong-kong and Canton the tea and silks of southern China are largely exported.

There are many ports on the rocky eastern coast of China south of the Yang-tse-kiang, such as Amoy, Fuchau, and Hangchau; but the bulk of the trade of China passes through the port of Shanghai, near the mouth of that river. Shanghai is the great importing centre of central China, and does a large export trade in tea and silk.

There are several ports on the Yang-tse-kiang, of which Hankau (= Hanmouth) at the mouth of the Han River, a tributary of the Yang-tse-kiang, is the most important, although river steamers proceed as high as Ichang, one thousand miles from the sea.

The trade of northern China passes mainly through the port of Tientsin, on the Gulf of Pechili; that of Manchuria through Niuchwang, on the Liautung Gulf. These gulfs are frozen in winter; but during the other months a vigorous trade goes on, more particularly from Tientsin, which is the port of Peking, the capital. Exports from this region are comparatively unimportant.

Silk, silk goods, and straw plait are our chief imports from Japanese ports. Copper, rice, carpets, lacquer ware, china, and beautiful fabrics are among the other goods exchanged for the cottons, woollens, metals, machinery, steamships, engines, and implements of all kinds sent from this country. The chief ports are Nagasaki, on the island of Kiushiu, and Yokohama,

the port of the capital, Tokyo, on the main island, Honshiu or Nippon.

**North American Pacific Trade.**—From Vancouver, and the towns of the Canadian Pacific Railway, and Victoria, on Vancouver Island, passengers and mails are conveyed to and from the Far East of the Old World, Australia, and New Zealand. The amount of direct oceanic communication with the British Isles is not very great. Manufactured articles are carried out in vessels which bring back timber from British Columbia, Tacoma, and Seattle, on Puget Sound, and Portland (Oregon), from which, as well as from British Columbia, canned salmon are largely obtained. These are also grain ports; but most of the wheat raised in western America is exported through San Francisco, which also exports gold and silver. In recent years the fruits, wines, fish, fresh and dried meat, of the rich Californian valley have been largely exported from San Francisco, and from Los Angeles in the south, to which ports clothing, metallic and textile goods, and sacks to hold grain, are consigned from this country.

**Tropical American Pacific Trade.**—Coffee and cacao are the most important exports from the Pacific ports in tropical America. Coffee is brought from Puntarenas, in Costa Rica. Guayaquil, the port of Ecuador, exports more cacao than any other port in the world.

**South American Pacific Trade.**—The dry regions of Peru and Bolivia furnish guano, cinchona (quinine), sugar, raw cotton, and india-rubber, while alpaca wool and silver come from the mountains, and vanilla from the wetter eastern sides. The chief harbours for imports are Callao, close to Lima (the capital), and

Molendo, from both of which railways ascend the Andes. Antofagasta, the chief port of northern Chile, is connected with the plateau of Bolivia by a railway, which brings down silver, copper, tin, cinchona, and other products of that country, as well as nitrate of soda from the Atacama desert, across which it passes.

Valparaiso, the port of Santiago (the capital), is the chief harbour of Chile. Cotton, mixed cotton and woollen goods, iron, ironware, and machinery are the chief articles taken out by our ships in exchange for the wheat, copper, wool, and guano shipped at these ports.

**Australian Trade.**—Australia is reached from Britain both by the Suez Canal and by Cape Horn. Mails and passengers from this country can also proceed to Australia and New Zealand by the Transatlantic lines to Montreal and New York, by rail to Vancouver and San Francisco, and thence by steamer across the Pacific. The exports from this country are chiefly manufactured goods, which are exchanged for wool, flesh, hides, southern fruits, butter, tallow, leather, gold, copper, and lead.

Fremantle, at the mouth of the Swan River, **Western Australia**, is the first port touched by vessels from western Europe, and here West Australian gold, wool, and hardwood timber are shipped. Fremantle is the port of Perth (the capital); and Albany, on King George Sound, which is joined to Perth by railway, is the southern port.

Port Adelaide, or Glenelg, both ports and suburbs of Adelaide, the capital of **South Australia**, is the next port touched at. Here wool, lead, copper, gold, silver,

wine, and skins are shipped in return for textiles, cotton and woollen clothing, shoes, iron, railway plant, hardware, tobacco, beer, and spirits.

Melbourne, on Port Phillip, is the chief town of Victoria. The goods imported from Britain are the same as in the case of Adelaide, but on a larger scale. Wool, butter, gold, and copper are the most important articles we take in return; but tallow and unworked leather are of considerable importance. Frozen and preserved meats and a little wheat are also sent to Britain.

Sydney, on Port Jackson, the capital of New South Wales, does a very large trade. Gold, silver, and wool are more, dairy produce less, important than in the case of Victoria, and a considerable quantity of meat, leather, tallow, hides, copper, and lead is exported.

In Queensland there are several ports to which we ship the same commodities as to the other Australian ports. The cargoes brought back differ considerably. Brisbane, in the south, is the capital, and the most important port. Here wool, hides, tallow, flesh, and preserved meat are still among the principal exports. Gold and shell are also important. From Rockhampton, Mackay, and Townsville railways run far into the interior. Townsville receives much gold from the Charters Towers mines. Wool becomes less important in the far north, and is replaced by tropical products.

Tasmania (capital, Hobart) has also a large wool trade, and Tasmanian fruits, more particularly apples, are becoming known in British markets.

**New Zealand.**—Auckland and Wellington are the



busiest ports in North Island; Lyttleton and Dunedin in Middle Island. Wool, meat, dairy produce, tallow, sheepskins, and Kauri gum are the chief exports. Kauri gum is obtained principally from North Island. The sheep of the Canterbury Downs in the Middle Island yield exceptionally fine mutton. Leather is also exported, as well as gold and silver.

## CHAPTER X.

### THE TRADE OF THE UNITED KINGDOM.

THE trade of the British Isles has passed through three stages. In the first, or primitive stage, which is of great antiquity, minerals, more particularly the tin of Cornwall, attracted traders from the Mediterranean. In the second, or mediæval stage, organic raw products, more particularly wool and hides, were exchanged for manufactured goods and articles of luxury. In the third, or modern stage, the process is to a large extent reversed, and manufactured goods have become the commodities chiefly offered in exchange for food, raw materials, and luxuries.

The trade of the United Kingdom has trebled itself during the last forty years. During the five years 1855-59 the average value of the imports was £169,000,000, and of the exports £116,000,000—making an average total trade of £285,000,000. Forty years later, during the four years 1895-98, the average value of the imports was £445,000,000, and of the exports £292,000,000—making an average total trade of £737,000,000, or, approximately,

three times as much as between 1855 and 1859. In 1901-3 the average annual value of imports was over £530,000,000, and of exports of all kinds £352,500,000, a total trade of £882,500,000. About one-fifth of the exports are of foreign and colonial produce. This trans-shipment trade has long been an important feature of British commerce, especially of the port of London.

In the imports the increase has been general. In the exports an increase has taken place in the case of most commodities, more particularly under the heads of machinery, textile fabrics, metals, and raw materials, more especially coal.

The tonnage of trading vessels engaged in foreign trade which entered the ports of the United Kingdom in 1903 amounted to nearly forty million tons, and over forty-seven million tons of shipping left its ports during the same period. This is an increase within the past five years of six million tons in the tonnage of vessels entering British ports, and of seven million tons in that of vessels leaving them. The coastal trade is over thirty-one million tons entered, and as much cleared.

Over one-fifth of the imports come from British possessions, and one-third of the exports are sent to them. By far the most important part of our import trade is with the United States, amounting to one-quarter of the whole. One-ninth of our imports come from France; over 6 per cent. from Australasia, the Netherlands,\* and the German Empire respec-

\* It must be noted that the trade of central Europe passing through Belgian and Dutch ports is reckoned as trade with Belgium and the Netherlands.

tively; nearly 6 per cent. from British India; and over 4 per cent. from Russia, Belgium, and British North America respectively.

The German Empire takes over 11 per cent. of our exports of all kinds, a larger proportion than any other country. It is followed by British India, over 10 per cent., and by the United States, nearly 10 per cent.; Australasia accounts for 8 per cent.; France for 7 per cent.; the Cape of Good Hope and Natal together for 5 per cent.; Belgium, the Netherlands, and Russia each for from 4 to 5 per cent.; British North America for  $2\frac{1}{2}$  per cent.; while Italy, Turkey, Argentina, Brazil, Sweden, China, and Japan each take about 2 per cent. of our exports.

It will thus be seen that our largest trade is with the United States, which is not only one of our best customers, but at the same time the source from which we derive most of our food products and raw materials, including a large proportion of all the wheat we consume and all the cotton we manufacture. Yet we import four and a-half times as much from it as we export to it. Next comes British India, to which we send manufactured cotton, and from which we obtain wheat, raw cotton, and many other natural products. Our trade with Continental countries is in the following order: France, Germany, Holland, Belgium, Russia.

About one-fifth of the trade of the United Kingdom is an entrepôt trade—that is, a trade in commodities imported for re-exportation. There is too little trade between many foreign countries to permit of a direct exchange of commodities between them. In such cases it is generally cheaper to use London as an

entrepôt to which cargoes from various countries are consigned in vessels which reload in London with suitable cargoes.

**Commercial Advantages and Disadvantages of the British Isles.**—It has already been pointed out that the distribution of high and low land in the British Isles makes communication easy, except in the Highlands of Scotland. The productive centres are either near the coast or connected with it by navigable rivers whose great tidal estuaries admit ships of large tonnage to safe harbours. On the west coast of Great Britain, where most of the rivers are shorter, good natural harbours are numerous. Coastal navigation can be carried on uninterruptedly at all seasons. The British Isles are favourably situated for foreign trade. They lie facing two of the wealthiest continents, Europe and North America, and almost in the centre of the land hemisphere.

The climate is everywhere temperate, permitting work to be carried on all the year through. The humidity is sufficiently varied to permit of every kind of pastoral and agricultural occupation, as well as the most delicate textile operations, being successfully carried on.

The abundance of coal and iron has contributed to the pre-eminence of the United Kingdom in the modern industrial world. These minerals occur together near lime and clay, affording great advantages for iron manufacture. Shipbuilding naturally developed in the iron centres near the coast, and the British are still the greatest ocean carriers.

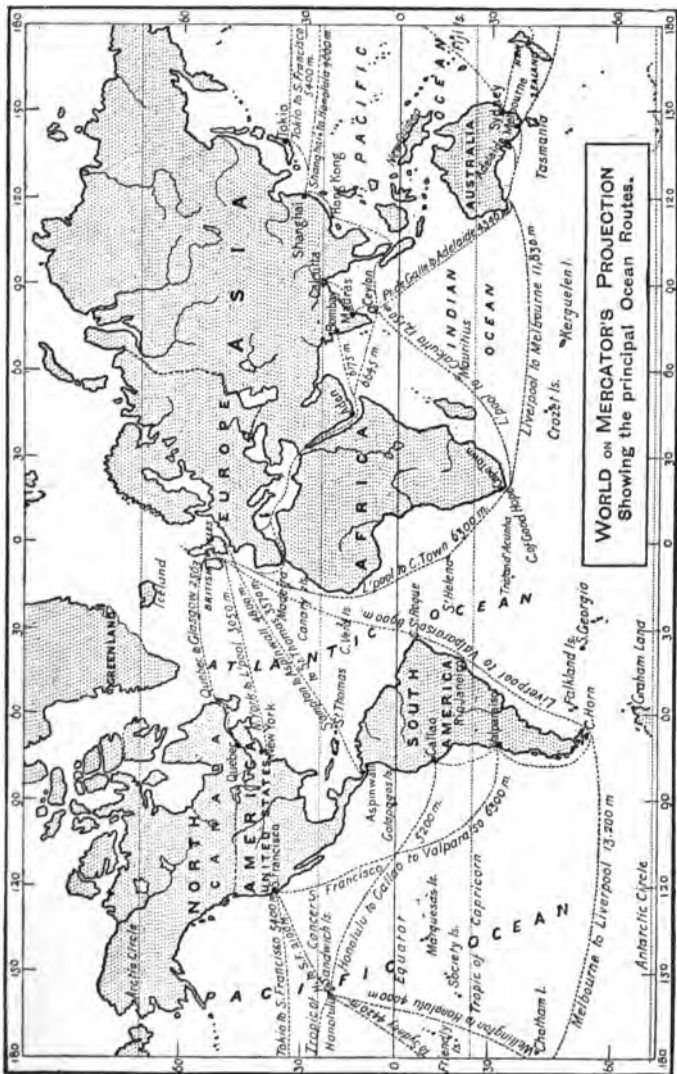
Besides these natural advantages, Britain has until recently spent little money in war for

many decades, nor are its working-men obliged to render compulsory military service, and thus, from an industrial point of view, waste three of their best years. Free-trade admits cheap food and raw materials from all parts of the world, and, before other nations began to compete, led to rapid industrial expansion. Home agriculture, however, was less favourably affected, and, owing to foreign competition, is not so flourishing as it should be.

Among the hindrances to our prosperity are heavy rents for land, high royalties on mines, and high transport rates, all adding to the cost of commodities. Still more serious drawbacks are our present educational system, which permits children to leave school too early, and a widely diffused indifference to education among the classes most in need of it. Agricultural depression, it has been said, is partly mental depression; and this is true of more than agriculture.

Much more might be made of our present resources. The problem of inland waterways must be seriously faced. Navigable rivers and canals all require to be widened and deepened. Almost unlimited water-power is available in mountainous regions for industrial purposes, while winds, and in many places tides, could also be subjugated to our needs.

Most extravagant of all is the incalculable waste of human capacity, which can only be remedied by a training which develops to the full the diverse capabilities of each individual, and inculcates in him an intelligent and sympathetic appreciation of the importance and utility of his work.



# APPENDIX.

## STATISTICAL TABLES.

### STATISTICS OF CROPS AND LIVE-STOCK, 1902.

	England. 1000 ac.	Wales. 1000 ac.	Scotland. 1000 ac.	Ireland. 1000 ac.	British Isles.* 1000 ac.
<b>TOTAL AREA OF LAND AND WATER.....</b>	<b>32,551</b>	<b>4,777</b>	<b>19,458</b>	<b>20,711</b>	<b>77,682</b>
<b>TOTAL ACREAGE UNDER CROPS AND GRASS.....</b>	<b>24,680</b>	<b>2,810</b>	<b>4,897</b>	<b>15,240</b>	<b>47,752</b>
<b>CORN CROPS—</b>					
Wheat.....	1,631	48	47	44	1,773
Barley or Bere .....	1,579	101	229	168	2,083
Oats.....	1,893	210	954	1,082	4,157
Rye.....	61	1	6	10	78
Peas and Beans.....	405	3	14	2	426
Total Corn Crops of all kinds.....	5,569	364	1,251	1,307	8,517
<b>GREEN CROPS—</b>					
Potatoes.....	413	31	130	629	1,215
Turnips and Swedes..	1,092	61	456	289	1,095
Total Green Crops of all kinds †.....	2,424	110	614	1,070	4,241
<b>CLOVER, SAINFOIN, and GRASSES under rotation</b>	<b>2,825</b>	<b>406</b>	<b>1,601</b>	<b>1,228</b>	<b>6,108</b>
<b>PERMANENT PASTURE...</b>	<b>13,463</b>	<b>1,924</b>	<b>1,419</b>	<b>11,576</b>	<b>28,409</b>
Flax.....	1	...	...	50	51
Hops.....	48	...	...	...	48
Small Fruit.....	68	1	6	5	80
	No. (1000).	No. (1000).	No. (1000).	No. (1000).	No. (1000).
Horses.....	1,155	154	195	509	2,023
Cattle.....	4,812	722	1,222	4,782	11,377
Sheep.....	15,034	3,463	7,269	4,215	30,058
Pigs.....	1,956	215	134	1,328	3,640

\* Including the Isle of Man and the Channel Islands.

† Including some not detailed above.

## FISHERIES, MEAN ANNUAL YIELD, 1901-3.\*

England and Wales.....	492,000 tons, worth £6,398,000
Scotland .....	329,000 " " 2,381,000
Ireland.....	33,000 " " 301,000
Total.....	854,000 " " £9,080,000
And including 'shellfish'.....	9,484,000

N.B.—Salmon are not included in this return.

## METALS EXTRACTED, 1902.\*

METALLIC MINERALS.	Minerals raised. 1000 tons.	Values. £1000.	Metals contained in the Ores. 1000 tons.	Values of Metals. £1000.
Iron ore and pyrites .....	13,435	3,292	4,400	14,245
Tin ore.....	8	514	4	532
Lead ore.....	25	176	18	199
Zinc ore.....	25	91	9	175
Copper ore.....	6	15	.5	27
Value of chief metallic minerals.....				£ 4,109,000
Total value of metals from British ores.....				15,287,000

## NON-METALLIC MINERALS EXTRACTED, 1902.\*

MINERALS.	1000 tons.	Values. £1000.	MINERALS.	1000 tons.	Values. £1000.
Coal.....	227,095	93,521	Gravel, sand.....	2,068	158
Clays.....	15,304	1,759	Gypsum.....	225	79
Sandstone.....	5,483	1,799	Barytes.....	24	22
Slate.....	517	1,502	Ochre, &c.....	17	22
Granite, &c... ..	5,467	1,400	Arsenic and ars. pyrites.....	3	20
Limestone.....	12,173	1,382	Others.....	115	89
Salt.....	1,894	578			
Oil-shale.....	2,108	501			
Chalk.....	4,396	194	Total.....		£103,026

\* From *Statesman's Year-Book*, 1904.



## COAL PRODUCTION, 1902.\*

DISTRICT.	1000 tons of coal.	DISTRICT.	1000 tons of coal.
ENGLAND—		England ( <i>continued</i> )—	
Durham.....	34,808	Other districts.....	11,991
Yorkshire.....	27,963	WALES—	
Lancashire.....	24,441	Glamorgan.....	29,077
Staffordshire.....	13,383	Other districts.....	5,226
Derbyshire.....	15,520	SCOTLAND—	
Northumberland.....	11,619	Lanarkshire.....	17,049
Monmouthshire.....	10,175	Other districts.....	17,066
Nottinghamshire.....	8,657	IRELAND.....	
Total, United Kingdom (1902), 227,084,871 tons.			

## PRINCIPAL ARTICLES OF IMPORT.

## MEAN ANNUAL VALUE, 1901-3.

£1000.	£1000.
Grain and flour.....	67,496
Cotton, raw.....	42,651
Wool (sheep and lambs')...20,683	
Dead meat.....	39,414
Sugar, raw and refined.....	16,506
Butter and margarine.....	22,688
Wood and timber.....	25,621
Silk manufactures.....	13,036
Flax, hemp, and jute.....	11,390
Tea.....	9,298
Woollen manuf. and yarn.....	12,091
Animals (for food).....	9,150
Oils.....	11,277
Chemicals, dye-stuffs, &c..	8,978
Seeds.....	8,457
Fruits and hops.....	9,381
Currants and raisins.....	2,143
Leather, dressed hides, &c.	8,169
Wine.....	4,858
Cheese.....	6,564
Eggs.....	6,159
Coffee.....	3,051
Tobacco.....	4,905
Metals—	
Copper ore, &c.....	3,983
" part wrought, &c.....	4,439
Iron ore.....	4,789
" pig, puddled, bar, &c.....	2,561
" and steel work.....	5,483
Machinery.....	4,391
Motor-cars and parts.....	1,031
Lead.....	3,685
Tin.....	4,275
Zinc and its manufac- tures.....	1,973

\* From *Statesman's Year-Book*, 1904.

## PRINCIPAL ARTICLES OF EXPORT (HOME PRODUCE).

MEAN ANNUAL VALUE, 1901-3.

	£1000.		£1000.
Cotton manufactures.....	65,661	Metals—	
"    yarn.....	7,596	Iron, pig .....	3,520
Total of cotton.....	73,257	"    railroad, of all sorts	4,007
Woollen manufactures.....	15,121	"    wire.....	390
"    and worsted yarn	5,460	"    tin plates .....	4,002
Total of woollen and		"    galvanised, &c. ....	3,904
worsted.....	20,581	Total iron and steel (in-	
Linen manufactures.....	5,331	cluding items not de-	
"    yarn.....	836	tailed).....	28,113
Jute manufactures.....	2,113	Hardware, cutlery, &c.....	4,399
"    yarn.....	524	Copper .....	3,278
Apparel and haberdashery.	9,008	Machinery.....	18,878
New ships.....	6,435	Coals, cinders, fuels, &c.*..	28,393
		Chemicals, dyes, colours,	
		&c.....	11,534

\* Coal for steamers engaged in foreign trade, 15,107,000 tons.

TONNAGE OF VESSELS ENTERED AND CLEARED AT  
THE PRINCIPAL PORTS OF THE UNITED KINGDOM,  
1902.

Ports.	For. and Col.		Coastwise.		Ports.	For. and Col.		Coastwise.	
	Entd.	Cleared.	Entd.	Cleared.		Entd.	Cleared.	Entd.	Cleared.
	1000	1000	1000	1000		1000	1000	1000	1000
	tons.	tons.	tons.	tons.		tons.	tons.	tons.	tons.
London.....	10,267	7,605	6,119	8,068	Manchester* ..	1,002	713	705	1,065
Liverpool.....	6,843	6,826	3,886	3,910	Grangemouth..	700	785	427	846
Cardiff.....	4,750	7,987	4,876	1,747	Harwich.....	740	693	217	245
Tyne Ports....	3,615	4,766	5,009	3,597	Bristol .....	811	426	905	1,280
Hull.....	2,615	1,966	657	1,128	Hartlepoons...	572	508	358	454
Glasgow.....	1,619	2,526	2,267	1,753	Goolse.....	582	524	828	860
Southampton..	2,045	1,808	1,873	1,562	Belfast.....	479	150	2,072	2,211
Newport, Mon.	943	1,522	1,886	715	Dublin.....	227	147	2,271	2,892
Swansea.....	805	1,595	1,221	547	Plymouth.....	210	117	770	805
Kirkcaldy.....	911	1,455	648	182	Greenock.....	123	78	1,781	1,965
Blyth.....	871	1,486	878	276	Cork .....	164	28	585	597
Dover.....	987	981	198	189	Portsmouth....	49	36	1,581	1,501
Leith.....	990	890	649	683	Beaumaris †...	16	13	1,825	1,831
Sunderland....	774	1,066	1,769	1,466	Cowes and I. }	4	9	1,936	1,928
Grimsby.....	900	898	246	197	of W. Ports }				
Middlesbrough	923	810	824	919					

\* With Runcorn.

† Including Holyhead.

# TRADE OF THE UNITED KINGDOM WITH DIFFERENT COUNTRIES IN 1901 AND 1902.\*

COUNTRIES.	Imports of Merchandise.		Exports of Produce and Manufactures of United Kingdom.	
	1901. £1000.	1902. £1000.	1901. £1000.	1902. £1000.
<b>BRITISH POSSESSIONS.</b>				
India .....	...	28,724	...	32,682
Australia .....	24,218	19,734	21,356	19,530
New Zealand .....	10,595	10,884	5,600	5,678
Canada .....	19,855	22,965	7,785	10,345
Newfoundland .....	533	643	358	375
South and East Africa .....	...	5,779	...	24,619
Straits Settlements .....	6,112	6,053	3,204	2,745
Hong-kong .....	603	610	2,613	2,136
British West Indies .....	1,838	2,149	1,911	2,009
Ceylon .....	4,477	4,387	1,535	1,446
British Guiana .....	442	540	560	619
Channel Islands .....	1,362	1,404	930	1,003
West Africa .....	1,955	1,992	2,347	2,737
Malta .....	84	56	1,143	1,196
Mauritius .....	318	243	989	399
All other British Possessions	656	630	2,243	1,509
<b>Total British Possessions.....</b>	<b>105,574</b>	<b>106,793</b>	<b>104,788</b>	<b>109,029</b>
<b>FOREIGN COUNTRIES.</b>				
United States .....	141,015	126,962	18,394	23,761
France .....	51,213	50,643	16,472	15,587
Germany .....	32,207	33,634	23,574	22,850
Holland .....	32,872	34,843	9,089	8,446
Belgium .....	24,666	26,539	8,156	8,410
Russia .....	21,904	25,674	8,673	8,635
Spain .....	14,040	14,286	4,827	4,785
Egypt .....	11,906	13,765	6,315	6,162
China .....	2,116	2,407	6,774	7,142
Brazil .....	4,958	6,208	4,152	5,390
Italy .....	3,384	3,582	7,613	7,410
Sweden .....	9,788	9,568	4,457	4,275
Turkey .....	5,708	6,111	6,767	6,025

\* From *Statesman's Year-Book*, 1904. The order therein is kept to facilitate comparisons with future issues.

COUNTRIES.	Imports of Merchandise.		Exports of Produce and Manufactures of United Kingdom.	
	1901. £1000.	1902. £1000.	1901. £1000.	1902. £1000.
<i>FOREIGN COUNTRIES (continued).</i>				
Argentina .....	12,415	14,022	6,752	5,871
Denmark .....	14,234	15,557	3,615	3,622
Portugal .....	3,305	3,411	1,711	1,841
Romania .....	3,994	7,692	1,023	1,224
Chile .....	4,313	4,524	3,231	2,839
Japan .....	1,830	1,899	8,132	5,066
Norway .....	5,564	5,409	3,243	2,919
Java .....	212	153	2,028	2,030
Greece .....	1,466	1,650	1,679	1,716
Foreign West Africa .....	599	698	1,126	1,133
Austria .....	1,191	1,340	2,141	1,923
Peru .....	1,814	1,351	991	948
Central America .....	911	640	831	719
Uruguay .....	475	653	1,323	1,532
Canary Islands .....	1,100	1,267	820	737
Mexico .....	264	305	1,551	2,171
Philippine Islands .....	2,702	2,251	863	814
Colombia .....	505	360	915	594
Venezuela .....	103	45	509	309
Algeria .....	698	603	438	416
Morocco .....	537	700	759	849
Ecuador .....	208	249	285	311
Haiti, Santo Domingo .....	55	61	210	196
Tunis .....	230	206	313	315
Foreign East Africa .....	51	46	745	1,341
Persia .....	200	211	548	370
Siam .....	51	89	252	251
Bulgaria .....	114	458	284	302
Madagascar .....	23	16	56	41
Indo-China .....	136	292	106	51
All other Countries .....	1,329	1,220	3,490	3,865
Total Foreign Countries .....	416,416	421,598	175,234	174,395
Grand Total .....	521,990	528,391	280,022	283,424

## COMPARATIVE PRICES OF COMMODITIES, 1903.\*

COMMODITIES.	Mean, circa.	Minimum.	Maximum.
<b>MINERALS—</b>	£ s. d.	£ s. d.	£ s. d.
Iron, Scotch Pig..... per ton	2 12 9	2 8 6	2 16 9
" Cleveland Bars..... "	6 7 9	6 2 6	6 10 0
" Steel Rails..... "	5 8 0	5 0 0	5 10 0
Coals, Best Wallsend, London "	0 16 0	0 15 6	0 18 6
Copper, G. M. B..... "	58 6 0	53 7 6	63 2 6
Tin, Straits Settlements.... "	127 2 0	115 10 0	137 5 0
Lead, English Pig..... "	11 19 6	11 1 8	13 8 9
Saltpetre, English Refined.. per cwt.	1 0 8	1 0 3	1 1 0
<b>TEXTILE MATERIALS—</b>			
Cotton, Raw, Middling Up-land..... per lb.	0 0 5½	0 0 4½	0 0 6½
" Yarn, 40 Mule Twist "	0 0 8½	0 0 7½	0 0 9½
Wool, South Down Hogs .... "	0 0 10	0 0 10	0 0 10
" N. S. Wales Greasy, Average..... "	0 0 10½	0 0 9½	0 0 11
Silk, Cossimbuzar..... "	0 11 7½	0 11 6	0 12 6
Flax, Riga ZK..... per ton	33 1 3	31 10 0	38 10 0
Hemp, Manila..... "	36 0 6	34 10 0	38 10 0
Jute, Good Marks..... "	13 14 9	12 5 0	14 10 0
<b>FOOD PRODUCTS—</b>			
Wheat, American..... per qr.	1 11 0	1 10 8	1 11 6
" British †..... "	1 7 4	1 5 0	1 10 3
Barley, " †..... "	1 3 0	1 0 1	1 4 3
Oats, " †..... "	0 17 3	0 15 9	0 18 8
Flour, Town Household..... per 280 lb.	1 4 6	1 3 3	1 6 0
Beef, inferior..... per 8 lb.	0 2 10	0 2 4	0 3 6
" prime..... "	0 4 9	0 4 4	0 5 2
Mutton, "..... "	0 5 9½	0 5 8	0 6 4
Potatoes, Good English..... per ton	5 1 8	4 0 0	7 10 0 ‡
Rice, Rangoon..... per cwt.	0 7 5	0 6 10½	0 7 10½
<b>FOR DRINKING, LIGHTING, &amp;c.—</b>			
Sugar, Beet..... per cwt.	0 8 2½	0 7 9	0 8 5½
" West India Syrups.... "	0 18 0	0 12 7½	0 13 9
Tea, Congou, common..... per lb.	0 0 3½	0 0 2½	0 0 4
Coffee, Ceylon low mid..... per cwt.	3 10 4	3 8 0	4 0 0
Oils, Petroleum..... per gal.	0 0 5½	0 0 5½	0 0 7½
" Olive, Spanish..... per tun	32 14 6	32 0 0	33 0 0
Tallow, Town..... per cwt.	1 10 6	1 7 6	1 12 9

\* Calculated or quoted from the list published by the *Economist*, 9th Jan. 1904. The teacher will find a price-list of commodities in the *Economist* (price 8d.). He is recommended to buy a mid-month issue, as it contains a supplement giving monthly trade returns as well as prices.

† Mean from *Gazette Averages*, 1903.

‡ New potatoes.

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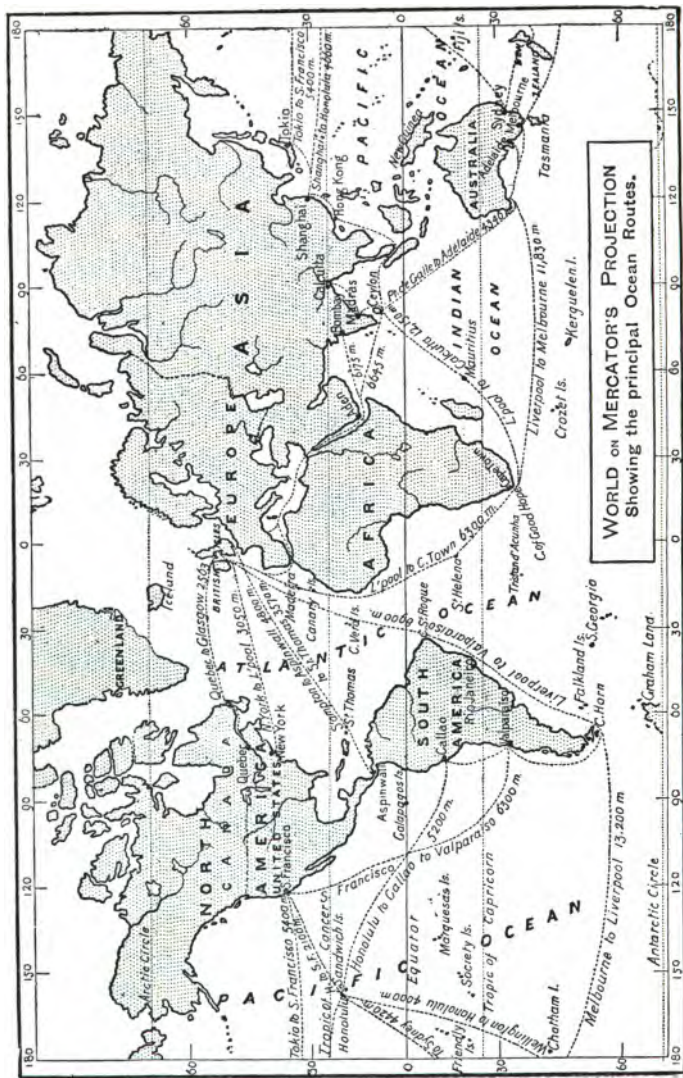
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OF THE WORLD  
OUTSIDE THE BRITISH ISLES

BY

A. J. HERBERTSON, M.A., PH.D., F.R.S.E.

LECTURER IN REGIONAL GEOGRAPHY IN THE UNIVERSITY OF OXFORD,

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## PREFACE.

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THIS book, while a continuation of the *Commercial Geography of the British Isles* published in 1899, is so arranged that it may be used independently, or even before it. Like the earlier work, it is based on lectures delivered for the Owens College and the Geographical Society in Manchester, and at the Heriot-Watt College, Edinburgh. The lectures have been rewritten in book form, taking into account recent economic developments. As far as possible the writer has attempted to interpret as well as to record the most important geographical phenomena of economic significance. The aim both of student and of teacher should be not merely to acquire facts but to correlate them, not to be a gazetteer but a geographer.

In this short book it is impossible to treat the economic geography of every country in an exhaustive manner. Nor is it necessary. It is not important that the beginner should know all about every country. It is important that he should know the main facts about the most important and typical countries, and accordingly certain countries have been chosen for fuller treatment. Having thoroughly mastered the facts for one type of country, the student finds it easy to treat similar but unknown countries in like manner from the larger geographical and statistical hand-books. This personal compiling of economic geography of different countries by the student should be a marked feature in all advanced classes.

The book is divided into two parts—(1) General; (2) Regional. A word may be said about the arrangement of the regional descriptions. An attempt has been made to arrange the British lands beyond the seas so as to secure some educational continuity, which is lacking in the order of treatment usually adopted. The temperate states, which most resemble in their conditions those of the British Isles, are taken first, and the tropical lands last. The student confining his attention to the British Empire will find the plan of the book suits his requirements, for he

## PREFACE.

has only to read straight on to the end of Chapter XIV., omitting Chapter XI., which deals with the non-British temperate lands of the southern hemisphere, and some paragraphs of Chapters XIII. and XIV., and in addition the *Commercial Geography of the British Isles*.

Chapters XV. to the end discuss the economic geography of non-British civilised lands, beginning in the Far East, where modern industrial methods are in their initial phase, passing by Europe to America, where they have been most fully developed.

Chapters VIII.-XIV. give an account of the regions producing on the whole mainly raw materials, and the order adopted is from the better to the less known; Chapters XV. to the end deal with the countries with considerable or extensive industrial development, and the order is from the simpler to the more complex.

Statistics are given for purposes of illustration and not for memorising. Readers are strongly advised to supplement them by reference to the latest edition of the *Statesman's Year-Book*, the most complete of geographical statistical manuals, from which and from official reports the statistics in this book are taken; or failing that, to *Whitaker's Almanack*. Every teacher should himself use, and make his students familiar with, the methods of employing the more important blue-books and consular reports, which should be found in all free libraries. The daily newspaper should be scanned for new information—which, however, in many cases requires to be carefully tested before being fully accepted. *Commercial Intelligence* is practically indispensable both to students and teachers, and is very reliable. The *Board of Trade Journal*, which costs a penny per week, should be regularly consulted.

It is impossible to give a complete list of references to official publications and books of all kinds consulted in preparing the lectures on which the book is based. Valuable bibliographies will be found in Mrs Herbertson's *Descriptive Geographies from Original Sources*. Readers desiring fuller information are referred to *Chambers's Encyclopædia* and Chisholm's *Handbook of Commercial Geography*, of which, we understand, a new edition will soon appear.

OXFORD, *Easter* 1903.

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# COMMERCIAL GEOGRAPHY OF THE WORLD

OUTSIDE THE BRITISH ISLES.

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## INTRODUCTION.

GEOGRAPHY deals with the distribution of things on the Earth's surface, Economics with the production, elaboration, exchange, and consumption of wealth. Economic Geography treats of the distribution on the Earth's surface of natural products of economic importance, and of the activities arising from their transportation, elaboration, and exchange. Economic geography has a twofold function. In the first place, it presents an accurate picture of the existing economic resources of the world; and in the second, it suggests ways in which these may be modified to the benefit of mankind. Tea, for example, which is gradually becoming the chief non-alcoholic drink of the world, will thrive on well-drained slopes receiving abundant showers, heat, and sunshine in summer, and it is hardy enough to bear a touch of winter frost. Wherever these conditions are combined, tea might, geographically speaking, be cultivated. Other considerations, however, come in. The economic conditions must also be suitable. Rent must be

reasonable, labour plentiful and cheap, and markets readily accessible.

Economic conditions are not necessarily unvarying. Thus, to take familiar instances, the application of steam-power to manufacture has altered the distribution of the great industrial centres, and concentrated population on the coal and iron fields. The development of electricity as a motive-power is increasing the economic importance of abundant water-power available for generating the current. Among economic factors, none perhaps is more important than density of population. So long as Australia was but sparsely inhabited, manufactures could not develop except on a small local scale. With the increase of population—that is, of possible purchasers—their development has begun.

Geographical conditions are fundamental and relatively unchanging. Climate, the chief geographic factor of economic importance, depends mainly on causes beyond human control. Indirectly, indeed, man can do something towards modifying its influence. The cutting down of the forests in the Mediterranean basin, though it cannot be said to have modified the Mediterranean climate, has appreciably diminished the fertility of large areas. Forests no longer check the heavy rains from gathering into torrents, which sweep the soil along with them, exposing bare, unfertile rock. Here man has played the spendthrift; elsewhere he has toiled to better purpose, draining the marsh, sinking wells in the desert, or introducing valuable plants and animals.

The task of economic geography is to select from the mass of geographic conditions those of economic

importance. In the chapters immediately following we shall consider the principal facts of the distribution of land and water, of plain and mountain, of climates and products, of populations and of their economic activities. After this has been done for the world in general, selected typical regions will be studied in greater detail, and their trade at the beginning of the twentieth century will be considered.

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## PART I.

### GENERAL ECONOMIC GEOGRAPHY.

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#### CHAPTER I.

##### LAND AND WATER.

**Proportions of Land and Water.**—Five-sevenths of the Earth's surface is covered by water, which, except for the fish of the shallow seas near the coasts, is almost unproductive. Until comparatively recent times the oceans have proved formidable barriers to commerce. Of the two-sevenths of the Earth's surface which consists of land, the greater part, as will be seen from the globe, is found in a hemisphere whose pole lies in the west of France, and the commercial centre of the land hemisphere, or land-centre, may be taken as coinciding approximately with the English Channel. Within this hemisphere nearly half of the surface consists of dry land, whereas



in the other half of the globe nine-tenths of the surface is covered with water.

**Routes radiating from the Land-Centre.**—The English Channel is the centre from which most of the great world-routes radiate, passing southward and westward across the Atlantic, or eastward by the Suez Canal. To the north the water-routes are blocked by ice-bound seas. Great land-routes have been built, the Great Siberian Railway to the east, and the Canadian Pacific and the other trans-continental lines of North America from the end of the northern transatlantic steamer-routes to the west. The Central American isthmus will in the near future be pierced by at least one canal, which will be the western equivalent of the Suez Canal.

**Land and Water Hemispheres.**—When we look at a globe on which the height of the land is shown, we observe that most of the land slopes towards the Atlantic, into which, or its bordering seas, the majority of the great rivers flow. The bulk of the lowlands of the world are therefore connected with the Atlantic. The Pacific Ocean, on the other hand, is bordered by lofty mountain-systems, which leave but a narrow coastal strip of lowland along that ocean, and cut it off from easy communication with the main mass of continental lowlands. This circumstance is of great economic importance. Not only is communication easier across lowlands than across mountains, but the lowland is also, as a rule, more productive and more populous. The Atlantic is, therefore, by far the most important ocean, as the most valuable lands from an economic point of view slope towards it.

Let us now look more closely at the configuration of each continent on a good contour map, or on a globe which shows relief.

**Europe** is deeply penetrated on all sides by sea, so that no part is far from the sea and its ameliorating influences.

The chief European seas are the North and Baltic Seas, the latter with the Gulfs of Finland and Bothnia, in the north; and the Mediterranean, with the Adriatic and Black Seas, in the south. The northern and southern seas present many contrasts.

The North and Baltic Seas lie in the midst of the lowlands, which converge towards them. A great part of these lowlands is fertile; communication across them is easy; and the North Sea rivers have tidal estuaries, which give ready access to waters which are shallow and rich in fish. On the other hand, the seas are stormy and often foggy, the shores of the Baltic are frozen in winter, and powerful ice-breaking steamers are required to keep the harbours open.

The Mediterranean is surrounded by lofty mountains, and only the north of the Black Sea skirts the European plains. The alluvial river-valleys and the deltas of its almost tideless waters are very fertile. With the exception of the Danube and the Rhone, the rivers are not of great importance as trade-routes. A mountain barrier on the north and a desert barrier on the south shut in the Mediterranean, which has a narrow exit to the Atlantic by the Strait of Gibraltar, and also, since the opening of the Suez Canal, to the Indian Ocean by the Red Sea.

**Asia** slopes to the north and to the east from a

central core of mountains, which rise from two to four miles above the sea, forming a practically impassable barrier lying east and west on both sides of the parallel of 35° N. The northern plain is extensive, and is drained by great rivers, which, however, are frozen in winter, and flow into the ice-bound Arctic Ocean. The Amur crosses a hillier land, but is also annually ice-bound. The Hwang-ho and Yangtse-kiang are the great rivers of the east. Both have formed rich alluvial regions. The Yangtse-kiang is navigable for ocean steamers for nearly one thousand miles. Much of the Indo-Gangetic plain, between the Deccan and the Himalayas, is equally rich. The festoons of islands which lie to the east and south-east of Asia are mountainous and volcanic. The fertility of the rich volcanic soil is intensified by the monsoonal climate (see page 24). In the island-dotted eastern seas navigation is easy, except for the dreaded typhoon at the change of monsoon, and has long been important.

**Australia** consists of a western plateau separated by central lowlands from the eastern mountains, which rise above a narrow coastal plain bordering the Pacific. For climatic reasons the eastern mountain region and coastal plain are the most productive and populous (see pages 81, 84, and 85).

The **Pacific** is dotted with numerous island groups, of volcanic or coral origin, often fertile, but of no great extent. New Zealand and New Caledonia, which will be considered with Australia, are the most important islands in the south.

The **New World** turns, as it were, its back to the Pacific. Mountains border the Pacific coast of both

North and South America from north to south, except at the isthmuses of Panamá and Tehuantepec.

**South America** contains a great central lowland, between the Andes in the west and the Brazil and Guiana highlands in the east. It is drained by three mighty river-systems—the Plate, the Amazon, and the Orinoco—to the Atlantic. These rivers and their chief tributaries are navigable almost to their sources. A tidal bore occurs in the Amazon, and is dangerous to navigation.

Volcanic and limestone rocks, some of coral origin, predominate in the **West Indies** and **Central America**. The volcanic regions are fertile. The West Indies belong to the Atlantic region. In Central America, however, the Pacific slope is the most productive part.

In **North America**, as in South America, a vast lowland stretches east from the western mountain barrier. This is easily penetrated from the Atlantic by the great rivers Mississippi-Missouri and St Lawrence, which drain the centre and south of the great plains. The utility of the Mississippi is diminished by the shallowness of the distributaries crossing the delta. The St Lawrence is frozen in winter. It is connected with a great chain of lakes—Superior, Michigan, Huron, Erie, and Ontario. Below the last-named are rapids, and above it the great falls of Niagara. Both obstructions have been avoided by canals. The Hudson, though small in comparison with the Mississippi or the St Lawrence, is exceedingly important, for it makes a break in the eastern or Appalachian highlands, and affords a waterway to the St Lawrence system from the ice-free port of New York at its mouth. The Nelson and Mackenzie systems have the

same disabilities as the Siberian rivers, flowing to oceans frozen many months annually, and being themselves ice-bound in winter. The rivers flowing to the Pacific are of greater consequence than the corresponding rivers of South America, but are not very important as routes to the interior, except the Yukon in the far north-west.

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## CHAPTER II.

### CLIMATE BELTS.

THE climates of the world determine the economic regions. Plants and animals are more closely dependent on climate than man, who penetrates to most parts of the world. Yet even man cannot live in health and perform arduous labour in regions where the climate is too extreme.

**Elements of Climate.**—The chief elements of climate are heat and moisture. Sunshine and wind are next in importance.

The heat at the Earth's surface is derived from the Sun's radiations. These pass through the atmosphere without material diminution, but are arrested by land or water. But for modifying local influences, the total number of hours of bright **sunshine** is theoretically the same at all parts of the globe, though their distribution throughout the year varies greatly in different regions. Between the tropics it is possible to have twelve, or nearly twelve, hours of sunshine every day; at the poles the year consists of a single long day and a single long night, all the sunshine being concentrated into the day—that is, the summer

six months. Mountains greatly diminish the hours of bright sunshine in the valleys, and the presence of fog or cloud lessens the quality of the light. There is also a considerable difference in different regions in the amount of solar radiations arrested by a square mile of the Earth's surface; and a surface sloping towards the Sun is better situated than one sloping in the opposite direction. Hence in Germany and France the southern slopes are planted with vines; in the south of Australia, the northern slopes.

**Heat Belts.**—At the equator the rays fall almost vertically at all seasons, forming the hot belts, where it is never cold. At the poles they fall more nearly horizontally, forming the cold belts, where the soil for the greater part, or even the whole, of the year is frozen. Between the hot and cold belts lie the temperate belts—consisting of two warm temperate belts where the mean annual temperature is over, and two cool temperate belts where it is under, 50° F. The temperate belts are the best-cultivated and the most densely peopled regions of the world; but the hot belt is that in which vegetation attains its greatest luxuriance. The cold belts are frozen deserts. The limits of the cold belts may be traced by drawing lines (isotherms) through places where the mean temperature of the warmest month does not rise above 50° F., which is necessary for the cultivation of cereals. The limits of the hot belt may be traced by drawing lines through places where the mean temperature of the coldest month is 65° F., which is high enough for continual growth if there is a sufficient supply of moisture.

Temperature falls very rapidly with altitude ( $1^{\circ}$  F. every 300 feet). Mountains, therefore, pass through various heat zones. Even in the hot belt, mountains of sufficient altitude have eternal snow on their upper slopes. A mountainous land in temperate or tropical latitudes has greater variations of temperature than a plain in the same latitudes.

**Wind Regions.**—The winds are of great economic importance, especially on and near the ocean. They may determine the wet or dry weather on which the growth or maturation of plants depends, and which regulates the flow of the rivers. They directly control the movements of sailing-vessels, and to a certain extent even of steamers. They also indirectly affect them through the surface currents of the ocean, which are driven by the winds.

The regions of calms approximately coincide with the equator, the tropics, and the polar circles. The doldrums, or calms of the equator, used to be greatly dreaded in days when ships depended entirely upon their sails. The tropical regions of calms are known as the horse latitudes.

Between the equatorial and tropical calms are the zones of steady or trade winds, which blow constantly from the north-east in the northern, and from the south-east in the southern, hemisphere. In these two zones, however, certain lands near the equator have alternately north-east and south-west winds in the northern, and alternately south-east and north-west winds in the southern, hemisphere. These winds are monsoon winds.

Between the tropical and polar calms are the belts of stormy westerly winds, which in the southern

hemisphere are known as the brave west winds of the roaring forties. Here the winds are not constant, but variable; winds from a westerly direction, however, predominate.

The courses of sailing-ships, and to a certain extent those of steamers, are planned so as to take full advantage of favourable, and to avoid adverse, winds. A ship sailing southward from the English Channel keeps near the west coast until it feels the influence of the north-east trade-winds, before which it scuds towards Brazil. It skirts the eastern coast of South America, making use of the Brazil current until near the horse latitudes, and then turns westward and takes advantage of the brave west winds in the South Atlantic and Indian Oceans if its destination is Australasia. A ship returning from Australasia does not come back in the opposite direction, but sails still eastward with the west winds across the Pacific, and enters the Atlantic round Cape Horn, makes for the eastern coast of the South Atlantic, utilises the south-east trades, crosses the north-east trade belt near the western side of the ocean, where the current flows northward, and traverses the North Atlantic to the Channel before the stormy west winds.

**Rain Regions.**—In most regions rain falls most abundantly in summer, when the heated air can contain the greatest quantity of water as vapour and tends to ascend to cooler regions, where the vapour is condensed. Equatorial regions, which have perpetual summer, are the rainiest in the world. The seasonal variations which characterise other regions are almost entirely absent, though there are short dry



periods, or rather breaks, when the Sun is overhead at the tropics.

North and south of the equatorial belt, extending from about  $10^{\circ}$  to  $20^{\circ}$ , there are two seasons in a year, the wet when the Sun is exactly or nearly overhead at noon, and the dry during the rest of the year. The Sudan and the monsoonal regions lie in this area. They are warm at all seasons, and the rainy season almost coincides with the hottest period of the year. In the case of India and south-eastern and eastern Asia the summer winds blow over the ocean, and become abundantly laden with moisture, causing torrential summer rains, and the region of alternate rainy summers and dry winters extends to much higher latitudes.

Dry deserts are found round both tropics in the centre and west of the continents. In the case of some, as, for example, the desert of Sahara in Africa, or the Australian deserts, the winds blow from cooler to warmer regions and mainly over land. They therefore contain little moisture, and do not readily part with what they have. Other deserts, like Tarym and Gobi in Asia, are surrounded by mountains which arrest the rain.

Temperate coastal regions, in latitudes higher than about  $40^{\circ}$ – $45^{\circ}$ , where westerly storm-winds prevail, have rain at all seasons, but especially in winter, when the winds are strongest and the land towards which they blow is coldest.

Regions like the Mediterranean, California, central Chile, the south-west of Cape Colony and of Western Australia and Victoria, lie in the dry area in summer, and in the moist west-wind area in winter. The

combination of mild wet winters and hot dry summers leads to very special economic characteristics.

Up to a certain height, which varies in different parts of the world, mountains receive more rain than the lands at their base. A cloud-belt is found girdling most lofty mountains, in which it is always damp. Above this belt the precipitation steadily diminishes.

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### CHAPTER III.

#### ZONES OF LIFE.

CORRESPONDING to the climatic belts are equally well-defined zones of plant and animal life, for climate controls the great divisions, while differences of soil determine merely secondary divisions, of the world of life.

**Tundra.**—The surface of parts of the frozen deserts thaws in summer. Water accumulates in the hollows, forming a marshy land known as the tundra. Reindeer moss, the food of the reindeer, is the only plant of economic importance. The dog and the reindeer have been domesticated by the inhabitants, who are partly pastoral, and partly hunters and fishers. They wander northwards in summer, and southwards in winter, towards the confines of the forest, to hunt fur-bearing animals such as the sable and the lynx, or larger game such as the stag and the elk.

**Temperate Forests.**—Except where the rainfall is too small, the cool belt is forested. The forest belt stretches across the northern hemisphere between 50° and 60° N., in eastern Asia crossing the arctic

circle, in central Asia having its southern limit at 55° N. In the east both of the Old and New Worlds it skirts the coast, and gradually becomes more and more tropical in character. In the southern hemisphere, Tasmania, New Zealand, and southern Chile are covered with temperate woods. The trees are conifers in drier or colder regions, and deciduous in wetter or warmer regions. Conifers predominate on the polar border of the forest, the interior, and the upper mountain-slopes; deciduous trees on the equatorial border and nearer the coasts. Many of the trees yield excellent timber. Among the pines, white, yellow, and red woods, and pitch-pine from the North American or European forests, are more used in buildings than any other wood. Conifers also yield resin and turpentine. The chief deciduous trees are the oak, beech, ash, walnut, maple, and hickory.

**Clearings in Temperate Forests.**—Much of the agricultural land of temperate regions is found where forests have been cleared, as in our own islands and most of western Europe. On the equatorial and oceanic borders of the temperate forests the hardier cereals flourish, such as oats, rye, barley, and wheat. Of these the hardiest is barley, which grows both farther north and farther south than the others. Oats and rye grow best in the cooler, wheat in the warmer areas of this belt, which afford the warm and comparatively dry summers necessary for ripening that grain. Potatoes, turnips, and beet are the chief root-crops, and flax and hemp the principal industrial plants. All kinds of vegetables, such as carrots, onions, peas, beans, cabbage, &c., are successfully cultivated. Fruit-trees do best in regions where the

summers are late and the early part of autumn is dry. The chief fruits are the cherry, apple, pear, and plum; the gooseberry, raspberry, blackberry, and currant; and smaller plants, such as the strawberry.

Rich grasses, which yield excellent hay, are among the most important temperate crops. On the plains they grow luxuriantly in meadows near the streams, and in the troughs of the valleys. Grasses also clothe the upper slopes of mountains above the tree-limit, and below the more barren area in which heather and bracken are interspersed with peat-bogs. Sheep thrive especially well on mountain and upland pastures, but are also kept in lowland meadows. Cattle and horses do better on lowland pastures. Pigs, poultry, and other animals are also domesticated in many parts. Few wild animals still remain in the forests of the settled region. Stags, foxes, and fur-bearing animals are hunted in the wilder parts.

The south temperate forests are denser than the northern ones, which they resemble in most characteristics. They cover a much smaller area, and have been exploited only in comparatively recent times. Fruits, timber, and, in the case of New Zealand, gum from the Kauri pine are the chief economic products of regions still forested, and sheep of the grass-lands.

The north temperate forests and their clearings are thus self-supporting regions, supplying all the needs of life. The uncleared forests have but few inhabitants. The clearings support a great number, in some of the richer agricultural lands more than two hundred per square mile. On the whole the density increases from pole to equator, and from the interior towards the coast.

**Steppes or Temperate Grass-lands.** — Grass-lands cover vast areas on the equatorial side of the temperate forests. In the Old World they extend from Hungary to Manchuria, between  $35^{\circ}$  and  $50^{\circ}$ , occasionally reaching as far north as  $55^{\circ}$  N. In the New World they lie between the Mississippi and the Rocky Mountains south of  $55^{\circ}$  N., and also cover much of the land east of the Andes and south of the Plate estuary.

The steppes have scorching summers and severe winters, with relatively little rain, which falls only in summer. The grass rushes up in the spring to more than a man's height, and is shrivelled up and often burned before winter. The most fertile tracts of steppe-land are on the forest side. The equatorial side of the steppe gradually merges in the desert. The steppes support innumerable flocks and herds, sheep and goats, cattle and horses, and, on the confines of the desert, camels. Milk, cheese, and wool are the chief products of commercial value, in exchange for which the steppe-dwellers, who are nomadic or semi-nomadic in the Old World, obtain tea and such manufactured articles as they require.

The steppes lend themselves readily to economic development. The constant decay of successive crops of grass forms an abundant supply of rich vegetable mould, which renders the soil exceedingly fertile. Where the rainfall is sufficient and the inhabitants have enough skill and energy to engage in agriculture, heavy crops can be obtained. The wheat of Hungary and southern Russia, and of the Dakotas and Manitoba, is grown on steppe-land. As the virgin soil becomes exhausted, rotation of crops is introduced, and mixed farming and stock-rearing are also carried on.

With the spread of agriculture the density of population increases, and with it commercial possibilities. The farmers of the steppe find it profitable to grow grain for the market as well as for home consumption, and the development of steppe cultivation has been rapid since modern means of communication provided a cheap ready means of placing produce on the market.

**Warm Temperate Forests with Winter Rains.**—The Mediterranean type of climate—hot dry summers and mild winters, with the heaviest rain early and late in the season—gives rise to a Mediterranean type of vegetation, whose distribution has already been noted (see page 24). The resting period of this vegetation is not in winter, as in our own country, but during the dry summer. The leaves of most plants are tough and evergreen, and thorny aromatic plants abound. Cork and evergreen oaks, cedar, and pines of various species are valuable either for their bark or timber; the mulberry is grown for its leaves, on which the silkworm feeds; and a very large number of fruits, which the dry, warm summer brings to perfection, are cultivated. Among these are the chestnut, walnut, acorn (furnishing valonia), carob (furnishing the locust-pod), olive, orange, lemon, fig, pomegranate, almond, apricot, and peach; but the most important of all is the vine. Barley and wheat are cultivated, but are not suited to the climate so well as maize. Even rice can be grown in the well-watered alluvial river flood-plains and deltas.

Except on the mountain-sides, grass requires careful irrigation. Sheep are driven to the mountains in summer, and to the plains in winter. Cattle, which

are not numerous, are used as draught animals rather than for supplying milk. Goats and donkeys are proportionally more numerous, and horses less so, than in the forest clearings. In general, animals which live in drier conditions and need less succulent food are more numerous.

The valleys and coasts are agricultural; the mountains and plateaus are pastoral. The former are densely, the latter sparsely peopled. Commerce is chiefly in agricultural produce, such as the olive, the orange, and the produce of the vine, which are much in demand, and which require climatic conditions found only in a relatively limited area.

**Warm Temperate Forests with Summer Rains.**—The warm temperate forest regions have a dry and cool or cold winter, which forms a resting period. They cover the eastern portions of the continents on the polar sides of the tropics to about forty degrees, and are in the monsoonal rainy regions north of the tropics in Asia, and in the normal trade-wind rainy regions elsewhere.

The great heat and moisture of summer promote the rapid growth of plants, whose leaves, many of which are evergreen, and timber are on the whole more valuable than their fruits; although fruits, especially of a succulent sort, are common. Rice, the most important cereal, is grown on all low-lying lands that can be flooded. Inferior varieties flourish on terraced mountain-sides. Wheat and millet are both cultivated. All kinds of citrons—oranges, lemons, &c.—flourish. Mulberries, many of which are planted as shade-trees, feed large numbers of silkworms. Tea is the characteristic plant of eastern Asia. It has been grown

with success in Natal, and could probably be cultivated in other regions with a similar climate. In South America it is replaced by *maté*, or Paraguay tea. Many valuable timber-trees are used locally. Cedars are imported from North America for making pencils, and Eucalyptus from Australia for paving. Turpentine is obtained from the pines of the eastern United States. The bamboo can be used for food, for clothing, for building, for drainage, and indeed for almost every conceivable purpose. Eucalyptus, castor-oil, and croton trees yield oil. Hemp is grown both for oil and fibres. Cotton, by far the most important textile plant, flourishes in this region, especially in North America, where the sea-island variety of the coastal swamps is long, strong, and fine. The ramie or China grass, a great nettle, yields what is perhaps the silkiest and strongest of vegetable fibres, and one which will be used more and more as improvements are made in the processes of preparing it for spinning. In China a laurel is used for making paper, and ginseng, opium, and other drugs are cultivated, as well as tobacco, which is grown in all parts. Many of these plants require careful cultivation. Agriculture is more carefully and laboriously carried on in eastern Asia than anywhere else in the world. The flood-plains and deltas of the great rivers Hwang and Yangtse are naturally very fertile, and the crops are greatly increased by elaborate methods of irrigation. Domestic animals are few, the pig, dog, and poultry being the most important. Population is very dense; in many provinces of China the number is over four hundred to the square mile. Notwithstanding this density, the



methods employed in manufactures are of an antiquated type.

The North and South American, South African, and Australian regions of this character are not nearly so thickly peopled, but in comparison with regions farther west in the same latitudes the population is dense. Most of the more laborious work is done by negroes, Indian coolies, or Polynesians, under European overseers. The higher lands, where the more temperate climate is suited to vegetation belonging to higher latitudes, especially in the lee of the mountains where the rainfall is lower, can be cultivated by Europeans.

**The Dry Deserts** are deserts for want of rain, and not from natural infertility. On the contrary, the soil is exceedingly fertile wherever irrigation is possible. The growth of date-palms, vegetables, cereals (maize, wheat, and millet), and pulses is restricted to the few oases, whither water is carried underground from some wadi, or where a spring exists. Acacias and other gum-yielding trees, frankincense, myrrh, and other spices grow in specially favoured spots. The richest lands are those where water is available, as, for instance, along the Nile or Euphrates; or where artesian wells have been sunk, as in southern Algeria, western Queensland, and parts of the western United States near the poorer grass-lands. Cotton, pulses, and cereals are among the products of Egypt, Turan, and Mesopotamia. In irrigated regions, such as Mildura and Renmark in Australia, fruits of all kinds flourish, more particularly Mediterranean species.

The desert is very sparsely inhabited. On the poor pastures at its edge goats and camels are kept.

In the desert itself caravan-driving is the chief occupation of all who are not settled in the oases. Gums, dates, and hides are the chief products, but commerce will long be small except in the favoured strips of fertile land flooded by the great rivers.

**Savanas or Tropical Grass-lands.**—On the equatorial side of the deserts, where the single rainy season of summer becomes marked, vegetation increases, and rich grass-lands intersected by tree-bordered streams predominate. These are savanas, which are distinguished from steppes by having hot instead of cold winters. Savanas are also found throughout inter-tropical lands above the lowlands. They can be traced in Central America and in the West Indies, in the llanos, campos, and catingas of South America, and also in the northern part of the pampas. They form a complete ring outside the Congo basin and the Kalahari Desert in Africa, which has therefore a certain unity from the southern veld to the park-lands of Uganda and the Senegal. Tropical grass-lands are also found in southern Asia and Persia, in the Deccan, on the uplands of the Malay Peninsula and Archipelago, and in the northern part of Australia.

In Africa herds of big game still wander about many parts of the savana, but the cattle-keeping races are gradually encroaching from both north and south. In America and Australia stock-farmers occupy many thousand square miles. The first step towards the exploitation of the savanas is the keeping of sheep and goats on the drier, and of cattle on the wetter parts. This will probably always be the most important occupation on the fringe of savana nearest to the desert. The savana, however, on the other side gradually

passes into dense tropical forest. This richer region is capable of very intense cultivation, and is already cultivated by the native tribes. Banana palms and coffee shrubs are the typical economic plants. Millet, and in Africa maize, on the higher lands, rice on the moister lowlands, especially of the East Indies, sugarcane in all parts, and cotton are the chief crops. Coffee is widely grown.

Europeans cannot endure hard manual work in tropical savana and forest lands without suffering greatly in health, and hard work is at present left, and probably will long be, to the native races. The economic possibilities of those lands are great, but as yet they are comparatively little developed.

**The Equatorial Forests** are always hot and moist. Rain falls at most seasons, but most abundantly when the noonday sun is overhead. Equatorial forests of the densest description cover the lowlands within fifteen degrees of the equator, and near the east coast extend to higher latitudes. They contain many valuable timber-trees, such as mahogany, ebony, and ironwood. The oil-palm is the most important tree in the African region. The coco-nut palm flourishes round the coast, especially of coral islands. Its dried kernels form the copra of commerce. The sago-palm is characteristic of the Malayan region, and mandioca or manioc, from which tapioca is made, of the South American one. Rubber and caoutchouc are tapped from innumerable lianas that wind about the forest-trees. Spices abound, such as cloves in Zanzibar and Pemba, and allspice, nutmeg, and cinnamon in the Moluccas and other eastern islands. The banana grows rapidly from cuttings planted in forest clearings.

Coffee and cacao flourish on the hill-slopes, the latter at higher elevations than the former. Neither can stand frost, and both require much heat, but are usually protected from direct sunshine by planting shade-yielding trees. Coffee is widely distributed, and may be grown throughout the forest and savana areas where sufficiently moist. Cacao, while cultivated a little in Ceylon and Java, is grown mainly in the West Indies (especially Trinidad) and Central and South America. Cotton and sugar-cane are important crops on the lowlands.

The unhealthiness of the tropical forests is the chief drawback to their exploitation. When first cleared the forest becomes even more unhealthy than before, but afterwards grows less noxious. Even the scanty inhabitants are not proof against the climate.

Ivory, long the chief trade in the African forests, is still playing a great part in the opening up of the Congo, and is inextricably associated with the slave-trade, which is not yet quite suppressed in Central Africa.

The resources of the vast intertropical regions are as yet hardly tapped, and constitute a most valuable reserve which will be exploited as means of transport are improved, routes are opened up, and the pressure of economic needs becomes greater.\*

\* See *Commercial Geography of the British Isles*, Chaps. VI. and VII., where the distribution of economic products imported into Great Britain is given under each product.

## CHAPTER IV.

**MINERALS.**

THE distribution of minerals cannot, like that of vegetation, be considered in a series of zones.

**Coal**, the only important mineral of organic origin, is very widely distributed, but is not at present found or used in any quantity between the tropics. This may be explained partly by our ignorance of the mineral wealth of many tropical lands, and it may also be that equatorial conditions do not favour the production of coal, which is composed of highly compressed vegetation, reduced to almost pure carbon by the removal of most of the oxygen and other gases, as well as of the water. At present most coal is worked between 35° and 57° N. in the United States, the United Kingdom, and the German Empire, but coal-mining is becoming increasingly important in all parts of the world, from Spitsbergen to New Zealand, from China to Chile, and from Klondike to Natal. Three kinds of coal are found—common black or bituminous coal, anthracite, and brown coal or lignite. Anthracite gives off no flame when it burns, most of the inflammable gases having been distilled from it. When this process is carried still further, graphite (plumbago or black-lead) is formed, which is plentiful in Siberia and Ceylon. Brown coal or lignite is vegetation less consolidated than in coal. Peat is a carbonised mixture of marsh plants.

**Petroleum**, mineral or rock oil, is formed by the slow distillation of organic matter in the rocks. In some

places this rises to the surface; elsewhere it forms reservoirs, which can be pumped to the surface by boring the overlying strata. It is abundant in Pennsylvania and surrounding states in North America, the eastern Caucasus, Galicia, Hungary, Rumania, Burma, Sumatra, Japan, Peru, and many other localities.

**Paraffin-oil** and **wax** are extracted from bituminous shales in Scotland, France, and New South Wales.

**Asphalt**, or pitch, found in the Pitch Lake, Trinidad, as well as near the Dead Sea and in several parts of Europe, is used for paving and as a damp-proof material. The Val de Travers asphalt, extensively used for paving, is a bituminous limestone found in Switzerland.

A large number of the rocks composing the earth's surface are used as **building-stones**, especially those which are durable and easily quarried. Soft **clays** are fired into bricks. Clays of special fineness are used for making porcelain—e.g. kaolin, a decomposed granite.

**Common Salt** (sodium chloride) is found as a solid on parts of the surface of the land, and in solution in seawater, from which it is extracted by evaporation, or, in very cold regions, by freezing. It is the only mineral used as food, and is so valuable that in some countries it is made a government monopoly—e.g. in India. In a solid form it is found (a) efflorescent in dry regions such as the salt deserts of Iran or Turan, or of the Great Basin of the North American Cordilleras, and round lakes with no outlet, where evaporation is at least as rapid as the inflow of fresh water, such as Lake Eyre in Australia; (b) as rock-salt, usually accompanied by sulphate of lime, especially in triassic rock, as in the

Salt Range of India, so called from its deposits of salt; and (c) in underground deposits, from which it is obtained by pumping water into a small mine, allowing it to become saturated, and then pumping it out and evaporating it. Brine-springs are found in many parts. The older rocks contain no salt, the original deposits having probably been washed out in the course of ages. In much of Africa it is practically non-existent, and is so valuable as to be used for money.

The **metals**, the most valuable of the minerals, are found mainly in igneous and crystalline rocks, unlike the preceding, which are found in stratified rocks. Most metals are found as ores, either pure or in combination with others. They occur (a) in regions which have been disturbed by crustal movements, the veins of ore lying in fissures in which it was deposited in solution; (b) in volcanic regions. They are rare in undisturbed rocks, and consequently the great alluvial plains of the world are poor in minerals.

**Iron**, by far the most important metal, is very widely distributed in different forms. The black or magnetic oxide, which is richest in iron, is found in central and northern Sweden, the Urals, Canada, Pennsylvania; red hæmatite, consisting of more than two-thirds of iron, is found as kidney ore in the north of Spain, in the Furness district of Lancashire, and as crystalline specular ore in the island of Elba. Brown hæmatite is similar in composition to the red, with a larger proportion of water, and is the most important ore of South Wales, Antrim, France, and Germany. Spathic iron ore, a carbonate of iron, forms the famous iron mountains, the Erzberg, in Styria. The same carbonate

in an impure form occurs in the clayband and black-band ironstones common in Britain.

The ironfields most worked are either near coal, as in Britain and Pennsylvania, or near the sea, by which ore can be cheaply transported to coal, as in Spain and Sweden.

**Tin** is less liable to decompose than iron, and is therefore largely used for covering iron to form tin-plate. Tinstone (or cassiterite, a binoxide of tin) is found abundantly in the Malay Peninsula and islands, and in Australia, Tasmania, and Bolivia.

**Copper** is rapidly growing in importance with the developments of electricity, as it forms an admirable conductor. The pure metal is found in Russia and near Lake Superior. There are numerous ores, which are mined in south-west Spain, Germany, the United States, Mexico, Chile, South Africa, South Australia, and Japan.

**Zinc** is a bluish-white metal used for plumbing and other purposes, and, in combination with copper, for making brass. It is found as blende (sulphide of zinc) in the United Kingdom, the United States, and Australia, and as calamine (carbonate of zinc) on the borders of Belgium and Prussia, in Upper Silesia, northern Spain, and the United States.

**Nickel** is a bright metal which possesses great strength and malleability, and does not readily tarnish. It is alloyed with steel to strengthen it, and many articles are nickel-plated to preserve them from rust. It is found in combination with magnesia in New Caledonia, and in combination with copper pyrites near Lake Superior.

**Manganese** is chiefly found as black manganese, a



binoxide. It is used to colour glass purple, and as an alloy in making strong steel.

**Aluminium** is light, very strong and hard, and always remains white. In recent years it has been much used in making torpedo-boats and bicycles. It is usually obtained by electrolysis from a clay called bauxite, found at Baux in France, and in the north of Ireland, or from cryolite, a mineral found in Greenland; the electric power being often derived from waterfalls, such as those of Niagara, Schaffhausen, and Foyers.

**Lead**, chiefly used for plumbing purposes, is extracted from galena (the sulphide), which is usually associated with some other metal, often silver, which it also pays to extract. Galena is found in most countries with old rocks, and is extensively produced in the United States, Spain, Germany, Mexico, Australia, and the United Kingdom.

**Mercury** is a liquid metal greatly used for making amalgams of other metals. It is found as cinnabar (the sulphide), from which vermilion is obtained, at New Almaden in California, Almaden in Spain, and Idria in Austria. It is much used in modern gold-mining and in medicine.

**Silver** is very ductile and malleable, and takes a beautiful polish. It is much used for table articles, ornaments, and coins, as well as for electro-plating, but it tarnishes very readily in the presence of even minute quantities of sulphur.

Native silver is found in Nevada, Mexico, Peru, and Chile, and at Kongsberg in Norway. Half the silver annually produced is obtained from silver-lead ores. The number of ores containing a sufficient proportion of silver, especially in the form of sulphides and

chlorides, to repay extraction is great. The world supply of silver has greatly increased in the past half-century.

**Gold** is heavy, ductile, constant in colour, and so malleable that it can be beaten out into leaves  $\frac{1}{250000}$  of an inch thick. It is used for coins, for plating all kinds of ornaments, and for gilding. It is found in all rocks in all lands, in rivers, glacial and sea sands and gravels, as well as in the ocean waters. The alluvial or 'placer' gold is isolated by a series of washings, which float off the lighter materials, leaving the heavier gold as a residuum. In recent years much gold has been obtained from quartz-veins. In regions where means of transport are well developed it is profitable to extract the gold when an ounce can be obtained from a ton of quartz. This is done by crushing the ore, then washing it like alluvial gold, or extracting it by amalgamation.

Gold is abundant, and very widely distributed. It is exceptionally abundant in the western Cordilleras of North America, in the mountains east and south of Siberia, in South Africa, in Australia, the Urals, and Hungary.

After the exhaustion of the then known placer-mines, the annual production of gold sank in 1881-90 to about £22,000,000 per annum. Since 1890 it has risen again, and the mean for the five years 1897-1901 was £56,120,000.

**Platinum**, the third heaviest metal, resembles gold in most of its properties. It is much rarer, and is principally obtained from the Urals. It is used for making chemical and electrical apparatus and in photography.

## CHAPTER V.

## MANUFACTURING AREAS.

SOME kind of manufacture is carried on by almost every people, and among many a special taste and skill are developed which give their work local or even world-wide fame. Thus China has become noted for its silks, embroidery, pottery, &c.; Japan for beautiful textiles and pictures, pottery, lacquer, and bric-à-brac of all kinds; India for finely carved ivory, rich inlays, brass-work, and fine textiles, such as the world-famous shawls of Kashmir. The work is manufactured in a literal sense—that is to say, made by hand, with a care and skill which gives it great beauty and durability. The increased demand which results from the opening of foreign markets has led to greatly increased production at the expense of quality, and to the degeneration of once artistic manufactures.

In the Western industrial world manufacturing has come to mean making by machinery, which at the present time is generally driven by steam. A machine turns out with great rapidity a large number of articles, which, however, are inferior in durability, and are marked by a uniformity which is inferior in artistic value, to the variety introduced by the living hand. This monotonous uniformity may perhaps become less universal if the more general use of electricity leads to the setting up of small motors to do the necessary mechanical work for the master crafts-

man, who nevertheless personally inspires and directs every operation.

At the present time it is roughly true that Asia produces handwork, but is in a state of transition, and that Europe and North America are in the mechanical stage. In the other continents the manufactures are not yet of much commercial importance.

The distribution of manufacturing areas, in the narrower sense, depends on a variety of conditions, of which the chief are: (1) easy access to raw material, which may be either (a) locally produced or (b) readily and cheaply obtainable; (2) available source of power, of which the commonest are (a) coal, for supplying steam-power, or (b) water, for supplying water or electric power; (3) abundant and not too costly labour; (4) ready access to markets, which may be (a) home or (b) foreign, or both. Of these conditions the second is the most essential, it being generally less costly and difficult to bring raw material to the source of power than to bring the source of power to raw material. Where all the conditions are fulfilled, as in our own island country, the industrial outlook is in the highest degree favourable.

Up to the present time it has been commonly stated that the presence of coal is the first essential for industrial development. In this rough generalisation there is much truth, as may be seen by considering the relation between the distribution of manufactures and the distribution of coalfields. In the case of Britain this has already been described (*Commercial Geography of the British Isles*, Chap. IV.).

The Franco-Belgian coalfield supplies fuel for the woollen, linen, glass, and steel factories of north-east France and Belgium. The Westphalian field yields coal for the iron, cotton, and silk manufactures carried on east of the Rhine, and for the woollen manufactures carried on west of that river. The Saxon, Silesian, Polish, and south Russian coalfields all produce coal which is applied to industrial purposes. Cotton, woollen, and linen are the chief textiles manufactured, and iron is the chief mineral industry.

Similarly, in the eastern United States, the Appalachian coalfield supports Pittsburg and many other manufacturing centres. There are, however, a great number of manufacturing centres which depend not on abundant coal, but on abundant water-power, which at the present time is chiefly used for generating electricity, the motive-power of the future. In Europe the best example is Switzerland, where coal is absent and water-power is abundant. In the United States the presence of coal has created the Allegheny industrial region. Water-power, on the other hand, in the New England Highlands and also along what is known as the Appalachian fall-line, has determined the site of the New England textile towns and the rapidly growing cotton-factories of the cotton-growing states.

## CHAPTER VI

## TRANSPORT.

HITHERTO we have but incidentally referred to the movement of produce from place to place. The study of this movement constitutes that branch of economic geography which is properly termed commercial geography, and forms its most dramatic chapter. This movement is partly determined by human needs and partly by facilities of transport. The development of transport enlarges the supplies and desires of man, so that we may say that as a rule increase of commerce and development of easy means of communication proceed hand in hand.

The means of transportation are very numerous, and differ in different parts of the globe. The chief methods are (1) porters; (2) baggage-animals; (3) draught animals; (4) mechanical propulsion, utilising (*a*) wind and current, (*b*) steam-power or other source of energy depending upon heat, or (*c*) electric energy.

Human beings are the most expensive agents of transportation, as they must not merely be fed, but in most cases paid as well, while their carrying power is relatively small. Human transport cannot be employed unless the route lies through fertile regions, where food is easily obtained, for a porter cannot carry his food as well as his load for any length of time. It is resorted to chiefly where no roads but footpaths exist, or under such special conditions as those in intertropical Africa, where the tsetse fly is a fatal enemy to horses and cattle.

The use of pack-animals, though more satisfactory, leaves much to be desired, both in the weight carried and the cost of transporting it. The food problem becomes an important one, especially in infertile regions. Narrow tracks are the characteristic roadways of regions where pack-animals are used, and this mode of transport is commonest in mountainous or densely wooded countries.

Among the animals used for carrying baggage are the yak in the cold snowy regions of Tibet; the llama in the Andes; the camel across the arid desert and the poor steppes which border it; the horse, mule, or donkey mainly in temperate lands.

With the introduction of a wagon which can be drawn, the transporting power of animals becomes very much greater, but the quantity which can be carried and the rate of transport largely depend on the nature of the roads. Over the roadless karroos of South Africa the ox-wagon is the chief means of transport beyond the railway; but in countries where roads exist horses are most commonly employed for haulage.

In the nineteenth century mechanical traction by means of steam-engines was gradually extended over great areas, chiefly in the temperate zone. This has proved a cheaper and more rapid means of transport on land than any other. The chief disadvantage is the preliminary outlay involved in surveying and constructing a carefully made permanent way with slight gradients. Expensive engineering works have been necessary, especially in mountainous districts, where innumerable ravines have to be bridged, and where the road has often to be tunnelled for long

distances through the solid rock. Europe and North America are now traversed by many lines of railway, and India, Japan, and the southern temperate lands have been opened up by them. The building of trans-continental lines has been of great economic importance. The first across America, the Union Pacific, was opened in 1869, the Canadian Pacific in 1885, and with the dawn of the twentieth century the Siberian Railway began to convey passengers across Eurasia from the Atlantic to the Pacific.

The use of electric and other motors is rapidly extending, and tends to replace horse haulage in streets and on roads.

A similar revolution has taken place in facilities of transport by water. A fertile country with a navigable river has always had the advantage of possessing a great natural route. On large rivers, the current can be utilised in descending, but oars and sails, and haulage by men or animals, are still used to propel boats up-stream. On the Amazon the constant up-stream wind blows the craft up the river. On the Yangtse-kiang the boats are hauled up the rapids above Ichang.

The advantage of water transport is great, for much larger quantities can be carried in boats than in wagons. This has led to the construction of canals for navigation, of which the Imperial Canal of China, seven hundred miles long, constructed in the seventh century, is one of the most remarkable. Canals must be level, and until locks were invented in the fifteenth century, they could not be built across very uneven ground without immense excavations. Just before the introduction of railways the canal system



was rapidly extended in our country to facilitate the transport of passengers and goods. Canals are greatly used for inland navigation, especially on the Continent, at the present day; and it is a matter of national importance that our canal system should be reorganised and extended.

The most recent developments of canals are connected with ocean navigation, and consist of (a) isthmian canals and (b) inland canals. The isthmian canals have been cut to save long detours, and are large enough to permit great ocean steamers to pass through them. The most famous is that of Suez, one hundred miles long, which shortens the journey from England to Bombay by sea by some 4500 miles. Smaller ones cross the isthmus of Corinth and that at the south of Schleswig-Holstein. The central American isthmus<sup>3</sup> will be cut for a canal at Panamá or at Nicaragua, and perhaps at both places. A ship-canal should be cut across the isthmus between the Forth and Clyde to permit more direct communication between many North Sea and all Baltic ports and the ports of the northern United States and southern Canada. The isthmus of Kra will perhaps be pierced to shorten the sea-route from India to the Far East.

The inland canals are too numerous to mention in detail. A simple form of canalisation is to dredge a river and regulate its outflow by dikes. Glasgow was thus converted into a port. In recent years canals have been excavated across the land to make Manchester a seaport, to permit large vessels to pass directly to Amsterdam from the North Sea at IJmuiden, and to avoid Niagara Falls and other obstacles on the St Lawrence system of waterways,

the most remarkable inland navigable tract in the world.

Coasting traffic has been important from the earliest historic times in the eastern Mediterranean and south-eastern Asia. Oars and sails were used before the application of the steam-engine to the propulsion of vessels revolutionised navigation. Larger and larger ships are now being built, and the speed of many of these great vessels is marvellous. The quicker Atlantic liners travel over twenty-three sea-miles per hour. Steamers ply between the chief ports of the world, and have largely replaced sailing-vessels.

For the development of over-sea commerce proper land communications are necessary. (1) There must be harbours where vessels can easily and safely load and unload. These may be natural or artificial. Of the natural harbours, landlocked inlets, island-protected shores, and river estuaries are the most important. The last are exceptionally valuable where the tide regularly rises and falls and permits vessels to sail some distance inland. (2) Behind the harbours must be a productive land. Many of the finest natural harbours in the world, especially on fiord coasts, are of no economic value at present, owing to their having no *economic hinterland*, except where minerals exist in the mountains which rise above them. The economic value of many hinterlands will rise in value with the increased use of water-power for generating electricity. Harbours where the hinterland is a fertile alluvial plain (e.g. Tientsin), a great river-basin where the chief streams are navigable (Rotterdam, Le Havre), or a busy industrial region (Liverpool), are the most important,

The importance of a particular port may wax or wane. We have already mentioned the tendency for the port to be located as near the heart of the industrial region as possible (e.g. Manchester, Houston in Texas, Montreal, Duluth, or Chicago replacing Quebec), so as to take the utmost advantage of the cheaper and more commodious ship transport. The other change is the rise of ports as near the land's end as possible (Le Havre, Rimouski) for the transference of passengers, mails, and goods which require to be transported with the maximum speed.

The economic conditions of the world to-day present a great contrast to those of a century ago, owing to the marvellous expansion of cheap and rapid means of communication. In the past, as in some parts of the world at the present, facilities of communication could scarcely be said to exist. Transport was slow, difficult, and dear. It costs 10d. per ton per mile to transport coal on the backs of donkeys in north-east China. Mr Chisholm states that before the opening of the railway it cost nearly  $2\frac{3}{4}$ d. per ton per mile to carry coal from Kilmarnock to Troon or Irvine in carts; and that it costs from  $\frac{1}{2}$ d. to 1d. per ton per mile to carry coal by train in England, and very much less in the United States. It costs only about  $\frac{1}{25}$ d. per ton per mile to carry building-stone across the Atlantic.

This cheapening of transport has revolutionised the commerce of the world. In olden times it was not possible to obtain any articles from distant places except those whose intrinsic value was high relatively to their bulk. Thus precious stones, silks, and spices were brought from the East, and gave rise to those exaggerated ideas of the wealth of the Indies, which

stimulated the great discoverers of new routes overseas. Now food-stuffs, raw materials such as wool, and minerals such as coal and iron ore, of relatively little value per unit mass, are freely transported.

Another stage in the growth of commercial relations between the most distant parts of the Earth has resulted from the introduction of methods of preserving perishable goods, by refrigeration, rarefaction, &c. This has greatly increased the available food-supply of densely peopled industrial regions dependent on outside sources for sustenance, and permitted their continuous expansion. It has also led to a growth of trade between tropical and temperate lands which is of great economic significance. The moist tropical regions so prolific of plant life may be made to yield a food-supply immeasurably greater than required by the present population of the world, especially if, as some authorities predict, sugar-yielding foods obtained from fruits gradually become of greater importance than starch-yielding foods derived from cereals, obtained mainly from temperate regions.

The interdependence of mankind has been greatly increased by the development of transport facilities. The intercourse of mankind has also been promoted, not merely by the transference of material commodities, but through the interchange of ideas by means of the telegraph and the telephone, which permit almost instantaneous communication of thought. Wires connect all the great centres of the world, many passing along the beds of the oceans; and at the beginning of the twentieth century new inventions have made it feasible to transmit words over immense distances without wires.

## CHAPTER VII.

## ECONOMIC MAN.

**Man as a Producer of Wealth.**—In the first four chapters the fundamental distributions with which man has to deal were discussed. In many regions man can live on the spontaneous productions of the earth; but where he relies on these alone, where only hunters and fishers live, the population is scanty. Man must produce as well as destroy, and the modern economic world, with which we have to deal in this book, is composed mainly of producers of wealth. Breeders of stock and cultivators of the ground use the reproductive powers of animals and plants to replenish and increase their stock and produce. They are limited in their distribution by the climate and life-zones described in Chapters II. and III. The manufacturer elaborates crude products into more useful articles. Without easy transport his sphere of influence is local; but with the use of mechanical power in manufacture and transport it may become world-wide.

A volume could profitably be written on the subject of this chapter, a subject not sufficiently considered in many courses on commercial geography. Only three aspects of it can be examined here, and these in the briefest way: (1) the effect of material surroundings on the intensity of man's work; (2) the influence of man's thought and ingenuity in increasing his productive powers; and (3) the effect of human associations in promoting and hindering economic, and especially commercial, expansion.

(1) **Varying Intensity of Human Activity due to Material Surroundings.**—In calculating the cost of production the intensity of human activity, manual and mental, must be taken into account. Climate and food are two of the most important factors. Education we will consider under another heading. The efficiency of the negro in Africa is much less than that of the white man in Europe. This is not merely a matter of racial difference, nor even a matter of easy satisfaction of the essential wants of food and shelter. The damp heat of the equatorial jungles is extremely enervating; the colder air of our continent is much more stimulating. The northern races in the northern hemisphere are, speaking generally, more energetic than the southern ones, and this is probably due to the influence of cold, which compels action to ensure warmth. To the invigorating effect of winter is due the contrast between the intense activity of the Chinaman relatively to that of the Hindu, in regions where the summer climates closely resemble each other. We can eliminate racial differences by considering the output of an Irish labourer at home and in the United States; and, indeed, contrast generally the greater initiative and energy of the North American of the centre and east compared with his brothers of the same stock in western Europe. It is worth noting that the climatic conditions where the European stock seem to attain their most intense activity are somewhat similar to those where the Asiatic people are most energetic.

A sufficient supply of nourishing food is another factor which is often neglected. The following

account of a contractor's experience in Jamaica is an excellent illustration of the importance of this factor. An American contractor building a railway in Jamaica found Jamaica negro labour excessively dear at one shilling a day, and that Alabama negroes did ten times as much; but a Jamaican negro who secured American food increased in strength until he was as good as the Alabama negroes (see R. T. Hill, *Cuba and Porto Rico*, p. 228).

(2) **Increase of Human Productive Powers due to Increased Thought and Ingenuity.**—It is less necessary to insist on the importance of mental training for economic progress, but it is needful to point out that mental alertness in practical affairs is obtained through dealing with concrete problems. A scientific training is essential for the economic man, who has to deal with the concrete facts of the world. The knowledge of natural phenomena and the development of modern labour-saving methods have grown together.

It is unnecessary to recapitulate these advances here—from the securing of proper shelter and food to the latest developments of wireless telegraphy, experiments in fertilisers of the soil, or attempts to make unhealthy areas healthy. All have a profound economic significance, commonly recognised in the case of mechanical improvements, but too often neglected in the case of biological advances.

We may briefly classify the more important of these applications of human thought and ingenuity as follows:

(a) Attempts to increase the natural productiveness of the soil directly by improved drainage and watering, food-supply (fertilisers), and the wider effects

of foresting and disforesting; as well as the more specialised attempts to secure ideal conditions by the use of glass-houses for plants.

(b) Efforts to secure more useful species of plants and animals by breeding as well as by feeding.

(c) The numerous devices for transforming raw products, animal, plant, and mineral, into manufactured articles by the use of machinery and natural forces.

(d) The special application of these mechanical devices to improved means of communication, either by transference of commodities or of thought.

(3) **Economic Influence of Human Associations.**—This would naturally lead us to consider the different groups of men and their economic efficiency, and the gradual economic transformation that is taking place within each at the present day, which is a subject for an advanced work on economic geography. In the present book we may cite one or two cases of the immediate economic effects of the occupation of a region by a group of men of higher or lower economic efficiency.

For instance, the western plains of Canada and the grass-lands on the southern margin of the Siberian forests were used only by a comparatively few wandering tribes until towards the close of the nineteenth century. With the building of the Canadian Pacific and Siberian Railways a great influx of farmers has taken place, who have settled on farms near the lines, which bring them many necessities of life, as well as not a few luxuries; and along which they can send the produce of their fields to markets in densely peopled urban centres. The potentialities of this agricultural development existed in these



regions in the days of the wandering Red Indians and Kirghiz, but these tribes were not in a sufficiently advanced state of civilisation to utilise them; they have been pushed aside by a more highly developed people who could. Of course, such changes have taken place both in the past and in the present without the potent aid of modern mechanical means of transport. In Manchuria the nomadic pastoral Manchus have given way before the industrious Chinese farmers, who now form by far the greater part of the population of this prosperous province. This, however, has not affected the world's commerce as the settlement of the plains of North America has done. We may find the converse of this in Mesopotamia, where a flourishing agricultural civilisation has been overthrown by pastoral conquerors, and a fertile land temporarily turned into a wilderness. Retrogression is not unknown in the world's history.

In intertropical lands other aspects of recent transformations due to the intervention of a higher economic civilisation can be seen in parts of Africa, where railways have been built, plantations formed, and the fruitful land made to yield not merely enough to supply the modest needs of the relatively few inhabitants, but produce of many kinds sought for by the complex civilisations of temperate lands. The initiative and supervision in this case also have come from Europeans or their descendants. Here the native is not displaced, for he alone can healthily perform the necessary manual labour; but his work is organised by the European, who also ensures the peace without which sound economic progress is impossible, whether in equatorial or temperate lands.

Finally, we have to mention the influence of political groupings and policies in the economic world. With few, and these not perfect, exceptions, political boundaries are barriers to economic circulation—(a) through the tariffs imposed on many commodities crossing them; (b) through the different languages, customs, weights and measures, and monetary systems, which in many cases hamper exchanges. The extension of such boundaries promotes expansion of trade. The unification of the German Empire has been a potent factor in its economic development. The internal freedom of trade over an area yielding nearly every kind of produce is of first importance in the economic expansion of the United States of America. The policy of Free Trade has been an important factor in the growth of the foreign trade of the United Kingdom to the largest in the world; and the fact that the greater and more compact natural resources of so vast a country as the United States will undoubtedly in time deprive us of the first place need not affect the bulk of our trade, nor is it an argument against the soundness of our policy. The ideally healthiest community from an economic point of view is that which makes the most of its own resources for its own wants, and permits the freest interchange with other communities. Differences in weights, measures, and coinages are unnecessary restrictions; while tariffs must be regarded as temporary expedients, which in some cases may promote local economic development.

## PART II.

### REGIONAL ECONOMIC GEOGRAPHY.\*

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#### CHAPTER VIII.

#### BRITISH NORTH AMERICA: CANADA AND NEWFOUNDLAND.

##### Physical Conditions.

**Configuration.**—The separation of Canada from the rest of North America is purely artificial, but a variety of causes have combined to favour its independent existence. The most important are the great estuary of the St Lawrence, the Great Lakes and other navigable waterways to which it is the eastern entrance, and the fact that the rugged and forested eastern highlands of North America south of the St Lawrence acted, before the construction of railways, as natural barriers, difficult to cross except by two narrow passages up the Hudson and Potomac. Canada consists of the St Lawrence basin, with a great area of wooded hilly land to the north, and of vast grassy, forested, or frozen plains to the west, whither until recent years only the fur-trader penetrated. Beyond the plains are the western Cordilleras, a barrier so formidable that, before the construction of the interoceanic Canadian Pacific Railway (C.P.R.),

\* The reasons for adopting the following order in the treatment of the Regions of the World are given in the Preface.

communication between east and west was easier by the long voyage round Cape Horn than over the high passes of the Rocky Mountains and the Selkirks.

Economically, as well as physically, Canada consists of three great physical divisions—(1) the mountainous west, (2) the plains of the centre, and (3) the uplands of the east—and in each we have to distinguish between the more temperate south and the colder north.

The **Western Region** is a sea of mountains, forming a great climatic barrier. Three ranges are of special importance—the Northern or Canadian Cascades, which border the coast and arrest much of the rain from the ocean; the Gold Ranges, rich in minerals, in the centre; and the loftier eastern Rocky Mountains, which rise like a huge rampart above the central plains. Except the south of Vancouver Island, all this part of Canada lies north of latitude  $49^{\circ}$  N., approximately that of Jersey and Paris. Lying in the west of the continent, it is in the track of the westerly storm-winds, and the climate of southern British Columbia may be compared to that of southern England or Ireland. The temperature is never very high nor very low, except in the inland valleys. On the western slopes of the northern Cascades, and on the higher and more exposed western slopes of the inland ranges, the rainfall is very great (about sixty inches a year), especially in winter; but on the lower eastern slopes and in sheltered valleys it is very low (under ten inches a year). British Columbia has, therefore, a great variety of climates. From the mild moist coasts to the snow-covered summits of the mountains, most of the land is densely forested,

leaving only the narrow flood-plains of the rivers available for cultivation. These rivers are the Fraser, Upper Columbia, and its tributary the Kootenay, which here and there form long, narrow lakes where the steep-sided valley slightly widens and flattens. The northern part of this western region is loftier. The St Elias or Sea Alps rise 18,000 or 19,000 feet above the coast, but the inland mountains are lower. The coastal region is always bleak and wet, but the interior is much drier, though extremely cold in winter, and only moderately warm in summer. It is ill fitted for cultivation, and produces only a low scrub. It is drained by the upper waters of the Yukon, known as the Lewes and Pelly Rivers.

The **Great Plains** gradually descend from the slopes of the Rocky Mountains to the east. They are crossed by many sluggish rivers, and are fed by the snows of the mountains. The surface is broken by low morainic heights, which here and there dam the rivers, causing them to expand into great lakes. The climate is one of extreme temperatures—cold in winter, hot in summer in the south, though, of course, cool in the north. The rainfall is low, and mainly in summer. The cereal crops derive their moisture in spring, not from showers, but from the thawing water in the soil, which has been frozen hard during the severe winter. The dry and warm chinook or föehn winds, known sometimes by the expressive name of ‘snow-eaters,’ blow in the west from over the Rockies in spring, causing the rapid disappearance of the snow from the surface, and allowing of early grazing.

The forest belt runs diagonally across the plain from south-east to north-west, with grass-land to the south-west, and to the north and north-east the icy desert, or tundra, including the Barren Lands.

**East Canada** consists of the Laurentian uplands, north of the Great Lakes and the St Lawrence, and the north-eastern part of the Appalachians, including the northern part of the New England highlands and the uplands of Nova Scotia, to which may be added those of the colony of Newfoundland. The climate, while neither so extreme in temperature nor so dry as that of the plains, is still much less mild and wet than that of British Columbia. In the Lake peninsula, in the latitudes of Rome and Turin, the summer temperature is high, and the rainfall is uniform and moderate at all seasons. The east coast is much wetter, with less marked extremes of climate. The waters round the edge of the Gulf of St Lawrence are frozen in winter, but the eastern and southern coasts of Nova Scotia and New Brunswick are not ice-bound. The Labrador Highlands have a very severe climate, and are at present of little economic importance, except for fur-hunters.

### **Economic Products.**

The natural wealth of British North America is very great. Fish abound in its sea and river waters; fur-bearing animals are still numerous on the edge of the tundra and in the forests, which also yield valuable timber; the dry grass-lands of the plains make

fine ranching-grounds, while minerals are very widely distributed.

**Fisheries.**—The eastern sea-fisheries are the most important in the world. The shallow waters south of Newfoundland and east of Nova Scotia, in the Gulf of St Lawrence and the Bay of Fundy, and off the Labrador coast are the feeding-grounds of innumerable fish. Cod, halibut, mackerel, and herring are caught on the Banks, and lobsters and oysters round the coasts, especially off Prince Edward Island. The populous centres of eastern North America form markets for a portion of this harvest. The surplus fish are either salted (cod), or canned (lobsters), or packed in ice and sent to Europe and the West Indies. Seal and whale fishing is carried on in summer in ships which sail from St John's, Newfoundland.

The sea-fisheries in the western sounds and fiords—where herring, black cod, and halibut abound—would be more valuable were markets nearer. The river (fresh-water) fisheries are here more important than sea-fisheries. Salmon, which are caught in vast quantities as they rush up the Fraser and Columbia Rivers in great shoals, making for the spawning-grounds, are largely canned for export.

Most of the Canadian rivers abound in trout and other fish. The Great Lakes contain lake-trout, salmon, herring, black bass, and many other species, which are sent in ice to the large cities of the interior.

**Furs.**—The northern forests are the home of many animals whose thick, furry coats protect them against the inclement winter. The fur-trade has been important for centuries, and still continues to be so. The Hudson Bay Company, formed to trade in valuable

furs, was formerly sovereign over much of the Dominion, but is now only a great trading company. The fur-traders, many of them French or British half-breeds, penetrate the great North-west, and either trap the animals or buy their skins from the red men. Through these fur-traders much of the interior has come to be known.

**Lumber.**—The great forests of Canada produce excellent timber in immense quantities. Pines yield the most valuable timber, but much of excellent quality is obtained from hard-wood trees such as maple, beech, ash, oak, and birch. Lumbering is carried on in winter, when the frost has hardened the marshes, and the snow furnishes a uniform hard surface over which it is easy to drag the logs to the nearest river. In the following spring these logs are formed into rafts, carried down by the flooded rivers, rowed across the lakes, and deposited finally at saw-mills, which are usually built where water-power can be obtained from neighbouring falls, and where, in addition, railways or ships are at hand to carry away the sawn timber. The Ottawa and the St John are the busiest timber rivers in Canada. At the towns of Ottawa, Hull, and St John lumber is sawn and manufactured into furniture and into agricultural and other implements, or transformed into pulp for paper-making.

In British Columbia the tall Douglas or Oregon pines and cedars are cut and sent across the Pacific as far as Australia, and are even brought to Europe.

**Ranching.**—The rainfall in many parts of the plains of the far west is too low to permit cultivation without irrigation. In the drier parts of south Alberta the grass grows in isolated tufts. The climate in winter,



however, is 'so mild that stock can be allowed to run at large, and the prairie grasses, gradually cured by the autumn chinooks, are as good food for cattle as they were for buffalo.

'Since 1894 more than 150,000 acres within the "arid regions" have received irrigation, so that in numerous cases the rancher, who had to import the grain he required from Manitoba, now raises it for himself, or saves the freight by purchasing it near at hand.'

**Farming.**—Agriculture is the most important occupation. With the opening of the railway across the western plains it has become possible to send farm products to market, as well as to carry settlers to new centres of cultivation. Thousands of square miles are now under cultivation, and the area of arable land is increasing yearly. Nevertheless, vast districts of the North-west are still unbroken by the plough.

Wheat is the cereal most cultivated, especially in the rich soils of the old lake basin known as the Red River Valley of Manitoba. The grain is sown in April and harvested in August, when it is thrashed and stored in an elevator close to the railway, ready to be transported to the Great Lakes for shipment to Europe. In the east, where wheat-growing was formerly important, farmers can no longer compete with the settlers on the virgin soil of the west, and little grain is now grown except as food for stock. Dairy and poultry farming is found to pay better, and butter, cheese, and eggs, as well as chickens and turkeys, are exported, preserved when necessary by means of cold storage,

The district round the Bay of Fundy, protected from strong and cold winds, is a great apple-growing region. The Lake peninsula, in the latitude of northern Italy, is famous for its fruits—apples, pears, plums, peaches, apricots, grapes, and many small fruits. Large quantities are sent to the big cities by express fruit-trains, and the surplus is preserved.

**Minerals.**—Canada is rich in minerals, both useful and precious. In the east, Nova Scotia is the most important mineral region, yielding some gold, but being more noted for coal and iron. The richest mineral region of Canada is in the western mountains, where nearly all the precious and useful minerals are found. In the middle of the nineteenth century, when the gold rush took place to the Rocky Mountains, many miners penetrated into the Cariboo district, where they found alluvial gold. This placer gold, as it is called, is still mined, more particularly in the Klondike district, where the soil is frozen most of the year, and has to be thawed before it can be washed and the gold extracted. In other parts of Canada gold is obtained from rocks, of which it forms but a small percentage. If an ounce of gold occurs in a ton of rock, it pays to crush the rock and extract the gold, provided routes exist by which machinery and food can be easily brought to the mining centre.

The most important of the quartz gold-mining regions are: (1) West Kootenay, in the south of British Columbia, where Rossland, on the Columbia River, has grown with the development of the mines; (2) the Rainy River district of Ontario; and (3) Nova Scotia. Silver-lead is found to the north of Lake Ontario and in the Kootenay district. Nickel is found at Sudbury, in

Ontario, north of Georgian Bay. The mines here are among the most valuable in the world. Copper is associated with nickel, and is found elsewhere round the Great Lakes and in the Kootenay district.

Canada is exceptionally well provided with useful minerals. A vast petroleum-field exists in the great plains. Excluding the undeveloped areas of the far north, Canada has nearly 100,000 square miles of coalfields. These may be arranged in four groups—(a) Eastern, (b) North-west Territories, (c) Rocky Mountains, and (d) Pacific Coast.

In the east the coalfields occur in the north of Nova Scotia, where they are associated with great deposits of iron, which have scarcely yet been touched. At Sydney, in Cape Breton Island, the shafts of the mines are close to the shore, and the coal is taken from under the sea. In the western plains brown coal, or lignite, is also widely distributed, supplying fuel in the treeless regions. In recent years important coalfields have been opened up in the Crow's Nest Pass in the Rocky Mountains, across which a railway now passes to the Kootenay district, where the coal, which luckily yields good coke, is used for smelting. The Rocky Mountains also contain anthracite of good quality, found at Anthracite, on the Canadian Pacific Railway. The coal-mines at Nanaimo, on Vancouver Island, the first opened in the west, export over a million tons annually. This is one of the few coal-producing regions of the eastern Pacific. Anthracite is known to occur on Queen Charlotte's and Vancouver Islands.

Coal, charcoal, and water-power are used in smelting Canadian iron ores. Large ironworks have lately been

started at Sydney, in Cape Breton Island, the ore being brought from Newfoundland, where it is very plentiful. At Pictou and New Glasgow, on the mainland, local iron is smelted with local coal. Nova Scotia promises to be one of the great iron-producing regions of the world. Steel as well as iron is now manufactured in Ontario, at the Sault Sainte Marie Falls, between Lakes Superior and Huron. Texada Island, between Vancouver and the mainland, contains much iron.

The mineral development of Canada will inevitably be great. British Columbia, with its wealth of minerals of all kinds, will grow in importance as population increases, and routes are opened up to many districts known to be rich in precious and useful minerals, but hitherto almost inaccessible.

**Manufactures.**—The principal manufactures of Canada are the elaboration of food products, the making of agricultural machinery and transport material, the manufacture of paper, the weaving of cloth, and the incipient working in metals just mentioned. Except for textiles, india-rubber, and cane-sugar, Canada supplies the raw materials for its manufactures, a circumstance which in some measure determines their character. Most of them have already been referred to in the section dealing with natural resources.

Fish-canning on the Fraser River; flour-milling at Winnipeg, in the centre of the wheat-growing area, and at numerous towns in Ontario; the butter and cheese making which has become so important in the eastern provinces, are all typical examples of manufactures resulting from Canada's wealth of raw

materials suitable for food. The abundance of timber has given rise to the industry of saw-milling at numerous waterfalls. With the development of population a further stage has been reached, and timber is not merely roughly sawn, but manufactured into implements, furniture, and paper. In other cases the abundance of available water-power has given an impetus to manufactures, for which the raw material, chiefly cotton or wool, has to be imported. A large number of towns in eastern Canada, more particularly in the Lake peninsula and in southern Quebec, are prosperous manufacturing centres. This most southern, most fertile, and longest-settled part of Canada is naturally the most populous. Without a certain density of population and access to a regular and cheap food-supply, manufactures cannot profitably be undertaken, and this explains the concentration of the manufactures in southern Ontario and Quebec. Nova Scotia and New Brunswick have even better water-power and easier access to coal, but neither, except in the recently started ironworks of Nova Scotia, has at present any considerable manufactures, although these are likely to become important in the future.

St John and Moncton, in New Brunswick, have cotton and woollen mills. In the days of wooden ships, Yarmouth, Nova Scotia, and St John, New Brunswick, were famous for their shipbuilding. Fishing-boats are still built, but the substitution of iron for wood in large vessels has seriously affected their prosperity. The abundance of coal and iron in Nova Scotia may some day lead to a revival of shipbuilding.

Quebec and Montreal, in Quebec, are the most important industrial centres of Canada. The Montmorenci Falls, near Quebec, supply power to a cotton-factory, and the city is famous for its leather, boots, and shoes. Leather and leather goods are also

manufactured at Montreal, but sugar-refining and the making of railway plant are more important, while the manufactures of apparel, of cottons, india-rubber, tobacco, and malt liquors are also among its industries. Hull, at the Chaudière Falls of the Ottawa River, opposite Ottawa, is a great saw-milling and paper-making town. South of the St Lawrence, Sherbrook, St Hyacinthe, and Valleyfield have cotton or woollen manufactures, and Sorel is a steamer-repairing town near Lake St Peter. Toronto is the largest city in Ontario, with saw, flour, and paper mills, breweries, distilleries, foundries, and furniture manufactories. Ottawa, at the Chaudière Falls of the Ottawa River, has many saw-mills. Kingston at the east and Hamilton at the west of Lake Ontario, and Peterborough at the Fifty Feet Falls of the Otenabee River, north of the Lake, London on the Thames, Guelph, Brentford, and numerous other smaller towns in the Lake peninsula, manufacture textiles, iron, machinery, and railway plant. The petroleum found in the region round Petrolia is refined in London, Ontario.

At Sydney, on Cape Breton Island, large ironworks have recently been started. Local coal and limestone are used for smelting the iron ore brought from Bell Island in Conception Bay, Newfoundland.

**Means of Communication.**—Canada has the most magnificent inland waterways of any country in the world, though they are unfortunately frozen during the winter months. The St Lawrence system is by far the most important. Since the river was dredged great ocean liners steam past Quebec through Lake St Peter to Montreal, over 1000 miles from the Atlantic. Above that city the Lachine rapids prevent further navigation by large vessels. They can be shot by river steamers coming from Lake Ontario, or avoided by the Beauharnois Canal leading to Lake St Francis. Most vessels, however, go by the Ottawa River to Ottawa, and follow the Rideau Canal to Kingston on Lake Ontario. The Niagara Falls bar

the passage between Lakes Ontario and Erie, but the Welland Canal is cut across the Niagara peninsula. From here navigation is uninterrupted as far as the St Mary River, which issues from Lake Superior as a great rapid (the Sault Sainte Marie, locally known as the Soo), at the side of which canals have been cut both in Canadian and United States territory. The recent deepening of these canals permits steamers drawing fourteen feet of water to penetrate to the western end of Lake Superior, 2250 miles from the Atlantic.

The traffic along this route is very great indeed, and if the United States vessels be included with the Canadian ones, the tonnage passing through the Soo canals during the months when they are open for navigation is considerably greater than that passing through the Suez Canal. The other rivers have long been used by the Indian or the half-breed boatman, who carries his canoe over short portages from river to river. The upper Columbia and Kootenay Rivers, joined by canal, and the lower Fraser are navigable.

The advance of Canada in recent years has been the result of a great development of the railways. The Canadian Pacific line, which now joins the chief ports in the east with Vancouver in the west, the longest railway, except the Siberian Railway, under one control, has carried emigrants to the rich virgin prairies in the west, and now transports the grain which they grow to Fort William or Port Arthur on Lake Superior. The building of railways in all directions across the western plains is progressing very rapidly, and a new transcontinental line is projected which will run north of the Canadian Pacific Railway.

Winnipeg is the most important centre. It has been proposed to build a line from Manitoba to Hudson Bay, which would bring this great region much nearer Europe, but the impossibility of navigating the Bay, except for a month or two in summer, renders the financial success of the scheme somewhat doubtful at the present time. In the east the Canadian Pacific has a rival in the Grand Trunk Railway, and the lines cross and recross each other in the Lake peninsula. The Intercolonial line joins Montreal and Quebec to Halifax and St John by the banks of the St Lawrence, and is entirely in British territory.

The Canadian Pacific not merely unites the provinces of Canada, but is an important line of communication between different parts of the British Empire. While the distance from Montreal to Vancouver is 600 miles shorter than from New York to San Francisco, it is nearly 1000 miles shorter from Liverpool to Japan and China by the Canadian than by the other route. Steamers ply regularly between Vancouver and Japan and China, and the mails are carried from London to Yokohama by Canada in half the time they took by the Suez Canal. The Canadian route is being superseded as a mail route to the Far East by the Great Siberian Railway, as the latter is the shortest route from Britain to Japan.

In summer Montreal is the terminus of the Atlantic liners which call at Quebec. The mails are taken up and landed at Rimouski, nearer the mouth of the St Lawrence, from and to which they are despatched by rail. From November to May the St Lawrence is blocked by ice, and Halifax or St John becomes the winter port. Some Canadian traffic is also carried on through Portland, Maine, and Boston, Massachusetts, in the United States.



The frontier between Canada and the United States being almost purely artificial, the lines of communication are numerous. Railways cross the frontier at many points both in east and west, and the steamers on the Great Lakes call at ports in both countries. A tunnel has now been cut beneath Lake St Clair at Sarnia, and huge ferries carry the trains from Windsor to Detroit at all seasons of the year. The Niagara River is bridged, and also the St Lawrence at Montreal. A canal follows the Richelieu River to Lake Champlain and the Hudson valley. A considerable traffic is carried on along the east coast.

**The Internal Trade.**—The internal trade of Canada is very great. All manufactured articles are made or imported by the eastern centres, and sent to the western plains in exchange for cereals. Coal from the Rocky Mountains is sent eastward across the plain as far as Regina, beyond which United States coal, brought across the Great Lakes, is found to be cheaper.

**External Trade.**—The exports of Canada are mainly forest products, wheat and flour, cheese, fish, gold and other minerals, and cattle. Canada can supply itself with most temperate products, but imports those of subtropical and tropical origin. These are largely food-supplies—more particularly sugar, tea, and coffee—and raw materials, especially cotton and india-rubber. Notwithstanding the abundance of coal, many parts round the Great Lakes find it cheaper to import United States coal. The bulk of the imports, however, are manufactured goods, including textiles of all kinds, and iron goods.

More than half the revenue is obtained from duties

levied on imports, which fall most heavily on luxuries, which in some cases pay about two-fifths of their value. The duties on other commodities average a little over a quarter of their value. Most raw materials and a considerable proportion of partially manufactured articles and foods are admitted duty free. A preferential tariff, reducing the duties by one-third, is applied to goods brought in from the United Kingdom, Bermuda, the British West Indies, India, Ceylon, the Straits Settlements, and New South Wales.

The countries with which Canada does most trade are the United Kingdom and the United States. For the five years 1897-1901 the average annual trade with the United Kingdom was £28,000,000, and with the United States £30,000,000. Nearly three-quarters of the trade with the former is an export trade; seven-tenths of the trade with the latter is an import trade. To the United Kingdom Canada sends 54 per cent. of its products; to the United States, 37 per cent. From the United States it obtains most of its manufactured articles and coal.

In the twenty-three years period 1878-1901 the percentage of Canadian imports from the United Kingdom has decreased from forty-one to twenty-three, while those from the United States have increased from fifty-three to sixty-three, from France from one and a half to three, and from Germany from less than a half to three and a half.

**Newfoundland.**—The whole island of Newfoundland is rich in minerals, including gold, silver, lead, copper, coal, and important iron ores, which are at present worked on Bell Island in Conception Bay.

The mineral wealth is otherwise little exploited. The fine pine-forests supply lumber in increasing quantities. The island is threaded by rivers, widening here and there to great lakes, and all are rich in fish. The climate is cold and moist. Oats, barley, and root crops are the chief agricultural productions.

Fishing is the most important industry, not, however, in the inland waters, but off the Great Bank which lies to the south. Over £1,000,000 worth of fish are exported annually to the United Kingdom, Portugal, Brazil, United States, and Canada.

The railway runs from St John's across the island, and a six hours' passage from Port aux Basques, near Cape Ray, joins it to Sydney in Cape Breton Island and the Canadian system.

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## CHAPTER IX.

### AUSTRALASIA.

THE economic conditions of our Australasian colonies resemble those of southern Canada in many respects. Australia lies nearer the equator than Canada. The extreme south of the North and all the Middle Island of New Zealand and Tasmania extend south of 40° S.—that is, into latitudes corresponding with those of the Lake peninsula of southern Canada. The North Island of New Zealand and southern Australia form a transition from these cool temperate to the intertropical conditions which characterise northern Australia.

## NEW ZEALAND.

The self-governing colony of New Zealand consists of two large islands, the North and Middle (popularly called the South) Islands; the smaller Stewart Island, to the south of the latter; and a number of distant and smaller groups.

**The Middle Island.**—The Middle Island, popularly described as the antipodes of England, lies in the latitude of Italy north of the Gulf of Taranto, but owing to its insular position in the water hemisphere (see page 16), it enjoys a cooler and more equable climate, resembling that of southern England in the extreme south, and that of the west coast of France in the north.

The most important physical feature is the western mountain-range—the Southern Alps—which traverses the island from north to south. This range, which rises to the height of 12,000 feet, is of economic importance not merely as a barrier to communication, but because of its influence on the rainfall of the island. The west winds striking against this lofty barrier are deflected upwards, causing heavy rains on the western or windward slopes. On the eastern or lee side they descend as warm, dry winds, resembling the chinooks of Canada (see page 60), and shake the ears from the too rapidly ripened corn. The rainfall of the Middle Island, therefore, presents a general resemblance to that of Great Britain (*Commercial Geography of the British Isles*, page 18).

The western slopes of the Southern Alps are covered with dense forests. Pines, cedars, and zimus are the principal timber-trees cut for sawing. Cattle are

fed on the forest undergrowth in the lower regions, but the upper mountain pastures are scarcely used. The eastern portion of the island is pasture-land, on which sheep, cattle, horses, and other stock are grazed. The value of the plains is being greatly increased by irrigation, and wheat, oats, barley, grass, clover, and root-crops are cultivated, wheat and oats being the most important. Sheep-rearing, however, is the chief occupation, especially on the Canterbury plains, which produce the famous Canterbury mutton and lamb, in which a large export trade is done.

The Middle Island, therefore, somewhat resembles British Columbia in its economic condition. It is essentially a pastoral country, with a little coal and gold mining. Agriculture will probably develop in the clearings of the eastern mountains, and fruit-growing may be extended in the east.

The **North Island** lies in latitudes corresponding to those of Portugal and northern Marocco. The mountains are lower and less continuous than those of the Middle Island, and are volcanic. The surface is irregular, and the quality of the soil varies greatly from district to district, fertile volcanic and alluvial soils alternating with barren clays.

The northern part lies in the summer track of the trade-winds, but elsewhere the climate resembles that of the southern island except that it is warmer.

The south and south-west, with good soil and heavy rainfall, are forested. Where the forests have been cleared excellent grass-lands are formed on the hill-sides, and agricultural lands in the valleys.

In the south-west cattle and cows are kept, and butter and cheese are made. The south consists

mainly of forests or grass-land. The east, with a low rainfall, has rich grass-lands on which millions of sheep are fed. In the north the rain falls in winter and spring. Mediterranean fruits of all kinds flourish, such as the vine, olive, orange, and lemon, as well as fruits of more temperate lands. Great forests of kauri exist, and yield much valuable timber. Kauri-gum, an ingredient of most varnishes, is as important as the timber. It is obtained after burning the forest, a practice greatly to be deprecated, or dug in a fossil condition. The broad leaves of New Zealand flax, or phormium, supply strong fibres, which are manufactured into rope, mats, and other articles.

**Minerals.**—In the Middle Island gold and coal are the most important minerals. Both alluvial and reef gold are mined. The chief coal-mines are near Westport. In the North Island gold-yielding quartz is found in the peninsula east of Hauraki Gulf, and is crushed chiefly in the Thames county. Some coal is found both north and south of Auckland, and north of Mount Egmont.

**Routes and Trading Centres.**—The chief towns of New Zealand are ports. Invercargill and Dunedin in the south, Lyttelton and Timaru (the outlets of the Canterbury plains), Hokitika, Westport, and Nelson are in the Middle Island; and Wellington, Napier, and Auckland in the North Island.

The railways in the Middle Island run from Invercargill through Dunedin, Oamaru, Timaru, to Christchurch and Lyttelton, its port, with numerous branches to the north and west. There are short lines from Hokitika, Westport, Nelson, Blenheim, and Picton,

Two roads cross the Southern Alps, one from Hokitika to Christchurch, the other from Westport to Nelson and Blenheim.

In the North Island a railway runs from Wellington to Napier. A line runs north from Auckland, and is continued to the south of that province. It is connected with the Thames valley and the picturesque volcanic lake districts in Rotorua.

The coasting traffic is important, and counteracts to a great extent the disadvantages of the disconnected railway system.

**Trade.**—Wool, frozen meat, butter and cheese, sheepskins and tallow, gold, grain, kauri-gum, and sawn timber are the chief exports of New Zealand. The imports consist largely of textiles and wearing apparel of all kinds, iron goods, sugar and tea, alcoholic drinks, books and stationery. Nearly three-quarters of the trade is carried on with the United Kingdom and with Australia. The rest is mainly with the United States, Fiji, India and Ceylon.

## TASMANIA.

**Physical Conditions.**—Tasmania lies in the same latitude as the northern half of the Middle Island of New Zealand, which it resembles in its climate and products. It is a mountainous island, the chief plains being in the basins of the Macquarie and Derwent. The climate somewhat resembles that of south-western England. The rainfall is very heavy in the west, where the land is forested, and occupied only by a few miners and prospectors. In the north and east the rainfall is less.

**Economic Productions.**—The area of grass-lands is restricted by the extent of the forests. Cultivation is confined to the valleys. Most cereals are grown south of the Tamar estuary. Temperate fruits of all

kinds do well, and apple-orchards are numerous in the south. Grapes are cultivated for wine in Maria Island, in the east. Sheep are the most important stock.

The mineral wealth is considerable, but not yet fully exploited. Tin is found in Mount Bischoff, in the west, and smelted at Launceston, on the Tamar. Gold is widely distributed, and is mined at Beaconsfield, on the Tamar; at Mount Lyell, near the west coast; and at other centres. Copper and silver-lead are found at Mount Lyell. Coal for local use is mined at Fingal, in the east.

Manufactures are in a rudimentary state, and entirely devoted to utilising local raw material. Saw-mills, jam-factories, and other workshops have been started.

**Means of Communication.**—A considerable coasting trade is carried on, and regular lines of steamers run from Hobart, in the south, and Launceston, in the north, to Victoria and New South Wales, New Zealand, and the United Kingdom. A railway joins Hobart to Launceston, with a branch up the South Esk River, past the Fingal coal-mines, to St Mary. Another line passes through the Westbury and Deloraine agricultural regions to Hamilton, on the north coast. Lines also run from the western gold and tin mines to the coast.

**Trade.**—The exports are minerals—copper, gold, silver, and tin—wool, fruit, and potatoes.

The imports are clothing, machinery and hardware, tea and sugar. The trade is mainly with Victoria, from which Tasmania is distant only 120 miles, New South Wales, and the United Kingdom.



## THE ISLAND OF AUSTRALIA.

**Position and Configuration.**—The continent-island of Australia lies between  $40^{\circ}$  and  $10^{\circ}$  S. (cf. Lisbon to Sierra Leone, Baltimore to Trinidad). It is a compact island, broken by few bays. The west is a plateau, above which rise numerous low ranges. The east consists of mountains, with steep slopes to the coast and gradual slopes to the interior. These mountains are lower, wider, and more irregular in Queensland than in New South Wales and Victoria, where they act as important barriers. A band of low ground, scarcely reaching above 1000 feet in the highest part, stretches across the island south of the Gulf of Carpentaria, which may be regarded as a submerged northern continuation of this lowland. In the south, the Gawler, Flinders, and Stanley Ranges rise above the plain.

The eastern coast north of the tropic is fringed by a great coral barrier reef, which forms a huge natural breakwater, 1200 miles long. The entrances across it are usually opposite the river-mouths, but navigation inside it, while smooth, is somewhat dangerous, owing to the existence of innumerable islets.

**Climate.**—Australia stretches almost as far north as south of the tropic. Most of it, therefore, lies in the trade-wind region. In the centre of the continent considerable extremes of temperature are felt, both the daily and the annual range being great. In the south it is cool in winter, especially on the higher lands, where snow sometimes falls; but in the north it is hot throughout the year. The trade-winds are laden with rain, which falls abundantly on the east coast, espe-

cially during the summer months, but they precipitate most of it on the eastern mountains, and the centre and west of Australia are often rainless for long periods. When rain does fall, it is in heavy torrential thunder-showers, which do as much harm as good. The south lies in the winter track of the stormy west winds, and receives most of its rain at that season. The north has the sun overhead at noon in the summer months, during which it is in the equatorial rain-belt.

The rainfall of Australia, therefore, is confined to the north, east, and south coasts; the west coast is comparatively dry, and the centre is almost rainless. The rainfall varies greatly from year to year. In some years damage is done by floods, while in others millions of animals perish through drought. The rivers vary greatly in size at different seasons, some drying up altogether except during and after the rains.

The following table shows the number of sheep that can feed on a square mile of land in regions with different rainfalls:

Inches of rain	...	...	...	...	8-10	13	20
Sheep per square mile...	...	...	...	...	8-9	96	640

It is easy to see how great a loss may have to be borne by a stock-raiser in a district where the average rainfall is fifteen inches, if during one or more years the precipitation falls to twelve inches or under.

From official figures for South Australia, it is calculated that the yield of wheat per acre is about six bushels less than the number of inches of rainfall in the winter six months, so that if this rainfall

is eighteen inches the yield will probably be twelve bushels per acre. With the extension of cultivation into the drier parts of the colony, the average yield has diminished.

**Economic Divisions.**—The economic divisions are dependent on the rainfall. It is necessary to distinguish (1) the practically unproductive desert; (2) the southern strip moistened by winter rains; (3) the regions of summer rains in the east; (4) the hot, wet, tropical regions of the north.

**The Desert.**—Much of the desert is covered with prickly scrub. Towards its edges is the salt bush, on which a few sheep can be fed. Most of its vast area is, however, wholly unproductive, except where irrigation is possible, when almost anything can be grown. The centre of South Australia and a very large portion of Western Australia are desert. The only inhabited parts are the goldfields (see page 86).

**The Southern Region of Winter Rains.**—The extreme south-west of Western Australia between Perth and Albany, the extreme south of southern Australia east of Spencer Gulf, Victoria, and the extreme south of New South Wales all lie within this region, which is the most temperate part of the continent, and best suited to settlers from the United Kingdom.

The colony of Victoria, the smallest and most southern of the Australian states, lies entirely within this region, and is typical of a country with a Mediterranean climate and productions in an early stage of economic development.

Victoria has approximately the area of Great Britain, and lies south of 34° S. It is traversed by a range of mountains running from east to west parallel to the

south coast, which is indented by the great bay of Port Phillip, dividing the southern coastal region into two parts, of which the eastern is called Gippsland.

The north-western flat land between the Murray River and the mountains receives little rain, and is covered with mallee scrub. This is now cleared and broken by a plough which rises over stumps in the ground. Some wheat is grown. The most valuable parts, however, are irrigated by the waters of the Murray River.

The rainfall is greatest on the southern slopes of the mountains, which are covered with forests, but are less fertile than the northern slopes, which face the sun. Gippsland receives both winter and summer rains, and the whole region is well wooded.

The characteristic products of warm temperate lands with winter rains do best on the northern slopes of the mountains. Wheat and oats are grown in the upper valleys and slopes, while on the northern plains maize can be cultivated. Fruit of all kinds, including the apricot, peach, fig, olive, orange, and especially the grape, is grown in the Murray and Goulburn valleys, especially where irrigation is possible.

The yield both of cereals and fruits varies from year to year with the rainfall.

The principal occupations are the raising and fattening of cattle and sheep for the market, dairy-farming in the west, horse-breeding, and hop-growing.

In the irrigated regions of Mildura and Renmark, along the lower Murray, much fruit is grown and dried.

The southern part of **South Australia** resembles **Victoria** in its winter rains. The crops are sown when

the autumn rains begin, and are harvested in the spring. Some excellent white and hard-grained wheat is raised, but the yield varies with the rainfall. Towards the north and west the country becomes too dry for agriculture, which is replaced by sheep-rearing.

The south-west of **Western Australia** resembles South Australia and Victoria. Considerable forests exist, which produce sandalwood and the hard jarrah and karri timbers, suitable for all kinds of paving and engineering work. Sheep, cattle, horses, and pigs are reared, the main drawback being the frequent droughts and the presence of poisonous plants. Wheat and hay are the most important agricultural crops. The resources of the country are still little developed.

The **Eastern Region of Summer Rains** includes the eastern parts of **New South Wales** and **Southern Queensland**. Above a narrow eastern coastal plain the mountains rise in steep escarpments, sloping more gently on the west towards the interior. Heavy rain falls on their eastern slopes in summer, but the precipitation gradually diminishes towards the west. Maize and sugar are the most important crops, but many sub-tropical fruits are grown. Between Sydney and Newcastle grapes and oranges flourish, but farther north the winter is too short for the vine to have a sufficiently long resting period, and the rains usually begin before the vintage is complete, even in the less rainy region west of the eastern mountains. Tobacco, cotton, pine-apples and arrowroot, and other fruits are also grown, especially towards the northern limit. At the eastern rim of the plateau, where the rainfall is more copious, a considerable amount of wheat is grown, especially in the south, and oats,

barley, rye, millet, and other cereals are grown both for their grain and for their straw. Farther west the grassy downs feed millions of sheep and cattle, and horses in smaller numbers. Wheat-growing, however, is increasing in importance in the southern part of the slope to the Lachlan and in the Riverina district beyond. The yield per acre, however, is low. Where irrigation is possible, agriculture is developing. Numerous artesian wells have been sunk, especially in Queensland.

Dairy-farming has developed considerably in New South Wales in recent years. It was formerly confined to the southern coastal region, but is now progressing in the north, where the mild winters allow cattle to remain out of doors all the year round.

**The Northern Hot, Moist Tropical Regions.**—**Northern Queensland** is typical of the hot, moist, densely wooded part of Australia. Rice, sugar, bananas, coco-nuts, mangoes, coffee, and other tropical products are raised. Sugar can be grown all along the coast. The Mackay region is the most important sugar district north, and Bundaberg south, of the tropic. Its cultivation is profitable only with very cheap labour. Kanakas—that is, Melanesians from the Pacific islands—are imported for this purpose, as the climate is too moist and hot for whites to engage in hard manual work. The yield of sugar is large, and by judicious irrigation the crop can be greatly increased.

Sheep and cattle are reared along the Flinders and Cloncurry Rivers.

The northern parts of **Northern Territory of South Australia** and of the **Kimberley Division of Western Australia** are similar in climate and products to

northern Queensland, except that the rainfall is hardly so great, and that the forest-land does not stretch so far inland.

Agriculture, which is done by Chinese labour, is possible only under irrigation. Fruits, such as bananas, coco-nuts, pine-apples, and mangoes; and cereals, such as maize and rice, as well as a little tapioca and tobacco, are cultivated.

**Australian Minerals.**—The discovery of rich placer gold mines in the fifties led to a great influx of gold-seekers to Victoria and New South Wales. Later, gold attracted immigrants to Queensland, and in recent years to Western Australia. In Victoria the chief gold-centres are round Ballarat and Bendigo (formerly Sandhurst). The gold is now mainly obtained from quartz. Gold is less important in New South Wales, where it is mined chiefly at Bathurst and Wyalong, the latter in the Lachlan district. The Queensland gold-mines are very important in the south, round the Gympie; in the centre where the famous Mount Morgan mines exist near Rockhampton; and in the north round Charters Towers, Ravenswood, Croydon, and Cloncurry. Gold is widely distributed in Western Australia, in the Kimberley district in the north, and in the Murchison and other goldfields in the west. The greatest development, however, has taken place in the south, round the Coolgardie goldfields, the chief centres of which are Coolgardie, Kalgoorlie, and Menzies. Food and water are scarce in these desert regions, and the gold is expensive to extract, but the opening of railways and the bringing of water from the Helena River, twenty-three miles from Perth, have improved the economic

conditions. The Mount Margaret goldfield, to the north-east of Coolgardie, is growing in importance.

**Silver** is found in many parts of the continent. The most important mines are in the Stanley Range, in the west of New South Wales, where the town of Willyama has grown up round the Broken Hill. Considerable quantities are also found in northern Queensland. In both these regions a little **tin** is mined.

The most important **copper-mines** are in South Australia, at Moonta and Wallaroo, on Spencer Gulf, and round Cobar in New South Wales.

The most important **coalfields** are those of the Hunter River district in New South Wales, of which Newcastle and Maitland are the chief centres. South of Sydney, the mines in the Illawarra district are growing in importance. Mines have recently been opened round Ipswich near Brisbane, at Howard near Maryborough, and Clermont in Queensland; and on the Collie River in Western Australia. In Gippsland great deposits of brown coal, in some places over 200 feet thick, have been discovered.

**Opals** are found at White Cliffs, north of Wilcannia on the Darling, in New South Wales, and in western Queensland. **Sapphires** are obtained in central Queensland. **Diamonds** exist in Western Australia, and **pearls** are obtained by divers off the northern coasts.

**Australian Manufactures.**—The population is still too small and widely scattered to permit of a great development of manufactures. In Victoria and New South Wales, where population is densest, manufactures are most developed. The number of hands employed is about the same in each state, and in both the making of textiles and clothing, of metal and



machinery, and the preparation of foods and drinks, rank first, followed by the manufacture of transport materials, paper, leather and leather goods.

The preservation of food for export is everywhere an important industry. The elaboration of dairy produce is important in the south, and sugar-refining in the north. Saw-mills are numerous both in the east and in the south-west. The other manufactures are concentrated in the larger towns, more particularly in Melbourne and Sydney and the other capitals, Geelong (woollen manufactures), Ballarat, and Bendigo in Victoria, Newcastle and Maitland in New South Wales, Maryborough and the sugar-producing towns of Queensland.

**Means of Communication.**—Australia, unlike Canada, is deficient in waterways, and the coasting traffic is much more important than that by river. Several of the eastern rivers are navigable for short distances. The Murray and the Darling are both navigable by light-draught steamers in the rainy season, the former to Albury, the latter to Bourke, but communication with the sea is prevented by the sand-bar at the mouth.

The railway system of Australia is gradually being extended, but unfortunately different gauges have been adopted for the lines in different states, involving break of bulk at the frontier. Adelaide, Melbourne, Sydney, and Brisbane are all connected by rail. From Adelaide the railway runs to the Broken Hill mines in the Stanley Range, and northward by the Flinders Range to the Alberga River beyond Lake Eyre. In New South Wales branches run to Murrumbidgee and Bourke on the Darling. From Brisbane

the line passes northward through Gympie and Maryborough to Rockhampton. A branch runs westward from Brisbane through agricultural centres as far as Charleville and Cunnamulla on the Warrago River. Two other lines run due westward to the centre of Queensland from Rockhampton and Townsville respectively. Numerous smaller railways have been built from several ports, such as Mackay, Bowen, Cairns, Cooktown, and Normantown, through sugar-growing regions to the mines. The railway network is densest in Victoria, especially north of the mountains. In Western Australia the lines radiate from Perth northward to Geraldton, and thence to Cue, on the Murchison goldfields; eastward through Yilgarn to Kalgoorlie, Coolgardie, Menzies, and other mining centres; and southward to Albany on King George Sound, and to Busselton on Geographie Bay. A short line also runs inland from Palmerston, on Port Darwin, in the northern territory of South Australia.

**The Australian Commonwealth** is composed of the six states, New South Wales, Victoria, Queensland, South Australia, Western Australia, and Tasmania, between which since 1901 perfect freedom of trade is allowed, except that Western Australia can still use higher tariffs. Statistics of trade for the Commonwealth have not yet been published, and the information available at the end of 1902 was derived from the various state returns. There is a protective tariff on imports from other countries, the details of which were not published when this was sent to press.

**Trade.**—Wool and gold are the most important exports of Australia, followed by meat, dairy pro-

duce, hides and skins, and sugar. The most important imports are textile fabrics and dress, ironwork of all kinds, foods and drinks, books, and articles of luxury. About 40 per cent. of the exports and imports of each state are from the United Kingdom or the continent of Europe, or other countries by way of the United Kingdom.

About 45 per cent. of the imports and 35 per cent. of the exports are from or to other Australian colonies, so that 16 per cent. of the imports are from, and 20 per cent. of the exports are to, other countries. British weights, measures, and coinage are used. The statistical tables at the end give further details, and should be consulted.

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## CHAPTER X.

### SOUTH AFRICA.

AFRICA south of the Congo-Zambezi divide lies between the same latitudes as Australia north of the Murray and Murrumbidgee. It is much narrower and much higher. Except north of Delagoa Bay, the coastal plain is very narrow, and most of the land lies above 3000 feet. It is a plateau land, bordered by lofty mountains only in the south-east.

The climatic conditions are similar to those of Australia south of the tropic. A small region of winter rains exists in the south-west, which may be compared with the south-west of Western Australia. In the east there is a narrow strip of land receiving a considerable rainfall in summer. The rainfall gradu-

ally diminishes from the top of the eastern escarpments towards the west. The climatic differences are that, owing to its greater elevation, South Africa has a lower mean temperature and colder nights and winters than Australia, and that, owing to its smaller breadth from east to west, the desert area is much less extensive. North of the tropic the temperature conditions resemble those of northern Australia; but the rainfall is lower, owing to the presence of Madagascar on the east, and the absence of sea to the north.

South Africa is therefore not so favoured as Australia. It has no equivalent for Victoria and the southern part of the east of New South Wales. The region with more than forty inches of rain, suitable for subtropical and tropical cultivation, is smaller; but the area with over ten inches, where stock can be kept, is proportionately as great as in Australia. The variations of rainfall and the frequency of droughts are as great as in Australia.

**Economic Divisions.**—The natural economic conditions also resemble those of Australia. The west of Cape Colony, Bechuanaland, and German South-west Africa are practically semi-desert regions, though in parts the land can be stocked with about one sheep to ten or twelve acres. Underground water exists, and the land may be rendered productive by irrigation, which, however, has not been found profitable up to the present.

The **South-western Region of Winter Rains** is more limited than in south-western Australia, extending, roughly speaking, from the Orange River to Mossel Bay. This is the wine-producing part of Cape Colony, in which all Mediterranean fruits except the olive can

be cultivated. Vines flourish best on the slopes of the Table and Drakenstein Mountains. Wine and brandy are both manufactured, especially at Paarl. The flat lands produce cereals. Malmesbury is the centre of the wheat-farming region. Oats and barley are cultivated in the same district, and in the valley of the Breede and its tributaries. Fruit and vegetables also do well, but the supply of agricultural and farm produce is not sufficient to meet local demands.

The coastal region, the Lange and Outeniquas Mountains, and the Little Karroo behind receive about as much rain in summer as in winter. The rainfall is greatest on the southern slopes of the mountains, where half of the few forests of Cape Colony are found in the Knysna region. Yellow and stink woods, the chief timber-trees, are felled in autumn, the former for railway sleepers, the latter for carpentry, furniture, and wagon-building. The eastern half of the Little Karroo has a lime-stone soil, which favours the growth of tobacco round Oudtshoorn.

At East London the **Region of Summer Rains** begins. Some forests exist in the south-east of Cape Colony, but they are less important than those in Natal, where, however, they have been too indiscriminately cleared. Yellow-wood, stink-wood, sneeze-wood, and iron-wood are the most important trees. The coastal region of Natal resembles that of northern New South Wales. Maize and sugar are the chief crops on the coastal plains. In the higher 'midland districts,' which correspond to the edge of the plateau in New South Wales, wheat, barley, oats, and rye are cultivated, and much land is devoted to stock-grazing. This

last becomes the chief occupation in the treeless 'upper districts,' where the winters are cold and the country is covered with thick grass. Parts of this region have recently been planted with black wattle, which yields valuable bark for tanning, and also improves the land.

The **High Veld** of South Africa is at present almost purely pastoral, except round the Caledon River and in the east of the Transvaal, where wheat is cultivated. In both regions the conditions resemble those of the eastern Downs of Australia. Sheep, the most important live-stock, are reared chiefly for their wool, while cattle are bred mainly for draught purposes. In the higher western regions the native sheep are kept, but in the more favoured parts the merino sheep is bred for its wool. The hardy goat, which can live in much less favourable regions than the sheep, is widely distributed, and the Angora goat from Asia Minor is reared, especially on the Great and Upper Karroos of Cape Colony, for its hair (mohair).

Horses cannot be used unless 'salted'—that is, protected from the fatal horse-sickness, to which they are very liable. Ponies, however, are reared in the Basuto highlands and in some parts of Natal and Cape Colony, in the extreme east of which horse-sickness is fortunately unknown.

The conditions on the **Rhodesian plateau**, between the Limpopo and the Zambezi, resemble those of Queensland immediately north of the tropic. Only the land above 4000 feet is healthy for Europeans. All kinds of subtropical and tropical cereals, vegetables, and fruits can be raised.

The conditions in Nyasaland and British Central Africa are those of a purely tropical country, where white men cannot settle permanently, except in a few favoured spots. Coffee has been planted with great success. Rice, maize, wheat, and other cereals, pulses, and many fruits can be grown.

**Minerals.**—Gold and diamonds are the all-important minerals in South Africa. **Diamonds** are found in the filled pipes of old volcanoes, which are scattered about the region near the confluence of the Vaal and the Orange. The finest are found at Jagersfontein, in the Orange River Colony. The discovery of diamonds in the seventies produced a rush of emigrants and fortune-seekers. Kimberley is the chief diamond-mining centre. **Gold** is found in many parts of the Transvaal and the Rhodesian plateau. The most important mines are those of the Witwatersrand, or Rand, where the metal occurs in a conglomerate locally known as 'banket.' The proportion of gold extracted is maintained as the reefs are followed underground, indicating that gold-mining will probably remain an important industry for at least two or three generations. Johannesburg is the centre of the gold-mining region, and the largest town in South Africa.

**Copper** occurs south of the mouth of the Orange, and is mined at Ookiep, whence it is carried by a railway to Port Nolloth.

Seams of poor coal are found in the Stormbergen, in Cape Colony. The best coal is obtained from the mines of Dundee and Newcastle in Natal, of Middelburg and the Witwatersrand in the Transvaal. Coal from the former is partly exported, and partly used

along with the Transvaal coal at the gold-mines. Coal has recently been found in North-west Rhodesia, and between the Shangani and Zambezi Rivers, in Southern Rhodesia.

**Manufactures.**—There are scarcely any manufactures in South Africa. The most important are those of wine and brandy in the south-western Cape Colony, and of sugar and rum in Natal. Some tanneries and saw-mills exist, and the Cape ox-wagon is a notable local product.

**Trade.**—Gold and diamonds are by far the most important exports. Wool, hair, and ostrich feathers, hides and skins are also exported from Cape Colony, and sugar and coal from Natal. Every kind of manufactured article is imported, as well as food, under which head are included not merely luxuries, but the necessaries of life.

**Means of Communication.**—The natural means of communication in South Africa are bad. No good harbour exists except at Delagoa Bay and at Sal-danha Bay, and at the latter no fresh-water exists. The harbours of Cape Town, Port Elizabeth, East London, and Durban have been constructed at very great expense, and are not yet entirely satisfactory. Cape Town, on Table Bay, the nearest port to Europe, is the port for much of the passenger traffic, especially since the building of the line across the Karroos and the Veld to the diamond-mines of Kimberley, a line now extended northward to beyond Bulawayo in Rhodesia. The produce of the mines is sent to Cape Town, Port Elizabeth, and East London. From the two latter ports a great part of the wool is shipped,



The development of the gold-mines round Johannesburg has led to the building of railways from all the African ports mentioned. The main line from Cape Colony passes through the centre of the Orange River Colony, that from Durban by the Newcastle coalfields, and that from Lourenço Marques, on Delagoa Bay, by the Middelburg goldfields and Pretoria, with an extension north to the Petersburg goldfields. Branches have been built from these lines to districts in the process of development. New lines are projected, but their construction has been retarded by the war of 1899-1902.

Salisbury, in Southern Rhodesia, is joined to the port of Beira through the Manika goldfields, on which New Umtali is built. This line will join that from Bulawayo, which is to be extended to the Zambezi. Where the railway has not penetrated, the ox-wagon is the common mode of transport.

The economic conditions of South Africa are much more complex and much less satisfactory than those of Australia. The plateau configuration of South Africa militates against ready communication with the coast. The rivers flow in deep gorges, so that water cannot be easily reached for irrigation purposes; and not merely does their volume vary, as in Australia, but they are broken by rapids. On the other hand, the supply of underground water, especially in Bechuanaland, resembles that of western Queensland and northern New South Wales. In the colonies south of the Limpopo only a quarter of the population is white. In the other parts of South Africa the blacks outnumber the whites by millions to thousands. The presence of this black population has led to their employment

for almost all manual labour, even in parts where whites can live and work without injury to health. The economic disturbance due to the Anglo-Boer war, following on plagues of rinderpest and locust, has retarded the economic development of the land, and intensified the antagonism, partly economic, partly cultural, of the white peoples, without whose harmonious co-operation no civilisation in South Africa can be stable or satisfactory, in view of the pressing problems resulting from the great preponderance of coloured inhabitants.

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## CHAPTER XI.

### SOUTHERN SOUTH AMERICA.

SOUTH AMERICA tapers acutely south of the tropic of Capricorn. In latitudes corresponding to those of South Africa it has almost the same breadth, but its configuration is very different. The central band is a vast plain, penetrated by the shallow La Plata estuary, and bordered on the east by the southern highlands of Brazil, which are not so high as the tableland of eastern South Africa, and on the west by the chains of the Andes, which, north of the Uspallata pass, do not descend below 10,000 feet, and form a practically insuperable barrier. South of this pass and the Plate estuary the eastern highlands practically disappear, the plain rises to the Patagonian plateau, the western mountains become lower, and rivers flow from their eastern slopes across them in deep gorges to the Pacific.

The **climate** presents great contrasts in east and west and in north and south. The eastern region round and north of the Plate receives wet summer winds; the western region here, as in Africa, is dry and semi-desert. To the south the southern New Zealand conditions are found in a more intense phase; the west is very wet with rain brought by western storm winds; but east of the mountains the climate is very dry, except close to the coast, where the winter storm winds bring a little rain. The chinook or föehn winds are common at the eastern base of the Andes, as of the Rockies or the Southern Alps of New Zealand.

**Economic Divisions.**—The **North-east Region of Summer Rains** resembles south-east Australia, with this exception, that the plains to the east of the Highlands are much better watered and more fertile than the corresponding lowlands of Australia south of the tropic. It is of interest to note that in North America the analogous plains north of the Gulf of Mexico are likewise well watered, the configuration in both cases favouring instead of hindering the inward movement of moisture-bearing air. Coffee is the chief crop of the Highlands close to the tropic, while farther south cattle and sheep roam on the campos. On the plains of the Uruguay and Paraguay maize and wheat are cultivated in ever-increasing quantities; and in the north oranges, olives, vines, tobacco, and other warm temperate crops are grown. The thick forests are confined to the coast and wetter valleys; the Gran Chaco consists of opener woodland. From these much timber might be obtained if transport facilities were greater. The *yerba maté*, or Paraguayan tea, is the

most notable spontaneous product. On the western and southern margins, where the rainfall is small, cultivation gives place to stock-raising, or the pampas are occupied by semi-wild horses.

The **dry north-west** must be divided into three parts. (1) The lands east of the Andes, whose snows supply water for irrigating the land, on which cotton, sugar, vines, and Mediterranean fruits of all kinds grow. This is a more favoured Mildura region. (2) The mountain area itself, with silver and other mineral ores. (3) The Chilean deserts, with important nitrate deposits.

**Central Chile**, with wet winters, resembles Victoria and the Cape peninsula regions in its Mediterranean type of climate and products, which make this the most flourishing part of Chile.

**Southern Chile**, with rain at all seasons, is a mountainous land cut up by many fiords, as in southern New Zealand, and bordered by islands separated from each other and the mainland by sounds. Here Scandinavian conditions are found nearly 10° nearer the equator. The fishing industry and the exploitation of the thick forests are not developed for lack of a market.

**Patagonia** is the dry south-western region, and is as yet hardly occupied. Stock-raising may well become important, and the lands where the chinook (cf. western Canada) influence is felt will become of agricultural importance when routes are opened to them. Sheep-farming is becoming important in districts within easy reach of Magellan Strait.

The **mineral wealth** is considerable in the Andes and in southern Brazil. Gold, silver, and copper are

found in the Andes, and coal occurs in Chile near Concepcion.

**Political Divisions.**—The republic of Chile occupies the western regions, Argentina the eastern, except where Paraguay, Uruguay, and southern Brazil extend in the north-east. The Falkland Islands are British.

**Chile.**—The dry northern region, where nitrates, largely worked by aid of British capital, and precious metals are the source of wealth, extends north of the tropic. Antofagasta is the outlet for Bolivian as well as Chilean produce. Iquique and Taltal export nitrates, Caldera (port of Copiapo) silver, and Coquimbo (port of La Serena) copper. All have railways to the interior, that from Antofagasta crossing the Andes to Bolivia.

The central valley of Chile is the agricultural region. Santiago, the capital, in the north, and Valdivia, in the south, are joined by a railway with branches to the coast. Valparaiso, the chief port, is near the former; Concepcion, farther south, is the outlet of the coal-mines.

Nitrates, copper and copper ores, iodine, gold, silver, leather, and wool are the chief exports; coal, manufactured articles, and subtropical produce the chief imports. Most trade is carried on with the United Kingdom, followed by the German Empire, the United States, and France.

**Argentina** is a republic with a great variety of physical and economic conditions. At present the stock-raising of the Pampas and the agriculture of the regions around the lower Plate basin and at the foot of the Andes are the most important occupations. Wheat, maize, flax, and sugar are the chief crops.

Lignite is found on the plains, some gold in the mountains, and petroleum at Mendoza at their base. Flour and sugar making and distilling are the most important industries.

A great railway network is rapidly being built over the whole country. From Buenos Aires, the federal capital on the Plate estuary, lines run southward to Bahia Blanca, north-westward through Tucuman to Salta, westward to Mendoza, and will ultimately cross the Andes to Santiago. Innumerable lines connect these main railways, and minor traffic centres exist at Cordoba and Santa Fé. The rivers also form navigable highways, and ocean-going ships can load at Rosario on the Paraná, as well as at Buenos Aires and Ensenada, the port of La Plata city, both on the shallow Plate estuary.

Cereals, especially wheat and maize, cattle, dead meat, wool, and hides are among the most important exports. Most of the wool goes to the continent of Europe, especially to France and Germany, but the United Kingdom and Belgium are also good customers, while Britain supplies more of the imported articles than any other country; Germany, the United States, Italy, and France ranking next.

**Uruguay** is the hilly land north of the Plate and east of the Uruguay. At present it is essentially a pastoral country, possessing vast flocks and herds. Wheat and maize are cultivated on the flat lands, and a little is exported. Vine, olive, and tobacco cultivation is becoming more important. The chief industry is meat preserving, carried on at Fray Bentos and Paysandu. Jerked beef and beef extract, hides, skins, wool, and tallow are the chief exports, Belgium and France,

then Britain and Germany, being the best customers. Argentina and Brazil, however, receive many exports which are re-exported. Britain supplies most of the manufactured articles imported, the other states mentioned, with Italy and the United States, sending the other imports.

**Paraguay**, called the Mesopotamia of South America, lies between the Pilcomayo and the Paraná, and is traversed by the Paraguay. Cattle-breeding is extending in the Chaco. Oranges and *yerba maté* are the most important plants cultivated, but many others flourish, such as maize, rice, tobacco, sugar-cane, manioc, coffee. Excellent timber is plentiful, but at present it is expensive to carry it to a market. Gold is found. Paraguay tea (*maté*), hides, and tobacco are the chief exports, trade being carried on through Argentina or Brazil with the outside world. The river-port of Asuncion, where the Pilcomayo and Paraguay Rivers meet, is the capital and chief centre.

**Southern Brazil** resembles Uruguay, but plantations are more numerous, especially in the districts of former settlers. The rest of Brazil is described on page 124.

**The Falkland Islands** lie nearly 350 miles to the east of the eastern entrance to the Magellan Strait, and consist of two large islands and many islets. The climate is cool, stormy, damp, and foggy, and the islands are grassy, the tussock grass forming excellent fodder and hay. Sheep-farming is the chief occupation; wool, skins, and tallow the leading exports. Port Stanley, the capital, is on the east of the east island, and here ships damaged in the stormy regions off Cape Horn put in for repairs.

## CHAPTER XII.

## INDIA AND CEYLON.

**Position and Configuration.**—India consists of the central of the three southern peninsulas of Asia, and the regions immediately to the north as far as the Himalaya Mountains. Physically it is made up of three very different parts: (1) the mountains of the north; (2) the broad band of the alluvial and sandy Indo-Gangetic plains, never rising over 1000 feet, and varying in width from 100 to 400 miles; (3) the peninsular plateau of the Deccan, south of 25° N.

The rivers Indus, Ganges, and Brahmaputra all rise in the Himalaya Mountains and flow across the northern plains to the sea, which they reach across great deltas. The Deccan plateau is much higher in the west than in the east. It has a steep slope to the Arabian Gulf, and a long slope to the Bay of Bengal, down which flow the rivers Mahanadi, Godaveri, Krishna, and Kaveri. The only important rivers to the west are the Nerbada and Tapti, in the north. In the south the low Palghat Pass lies south of the Nilgiri and north of Cardamom Mountains, which form part of the Western Ghats or Sahyadri escarpment, and joins the eastern and western coastal regions.

**Climate.**—India occupies similar latitudes to the continent of Australia. If Ceylon be added to the former, we must add British New Guinea to the latter.



India, however, has the mountain barrier of the Himalayas on the polar side, whereas the polar side of Australia is bounded by the open ocean. This circumstance makes a great difference in the climate of the more temperate parts of the two countries. The mountains hinder, the ocean favours, the inflowing of winds from cooler regions. India is, therefore, hotter than Australia in the same latitudes.

The temperature of India varies comparatively little with latitude. The extra-tropical regions are, however, coolest in the northern winter, when their temperature is like that of England in June, and the north-west is hottest in summer. It therefore has the greatest range of temperature. The peninsular portion is uniformly warm at all seasons.

The north-west of India, like the south-west of Australia or South Africa, receives most rain in winter. So do the south-east of India and the east of Ceylon, lying in the track of the north-east trades, which have absorbed moisture in crossing the Bay of Bengal. The north-east trade-wind is the normal wind of the winter half-year; but in summer, instead of being intensified as is the south-east trade-wind of Australia, it disappears, and is replaced by a south-westerly or south-easterly monsoon wind, which moves towards the low-pressure centre formed over the region of greatest temperature in the north-west.

For most of India this summer monsoon brings the rain, so that, as in the greater part of Australia and South Africa, most rain falls in summer. In the extreme south-west of India and western Ceylon rains diminish in intensity towards midsummer, so that we

may speak of two rainy seasons. The single rainy season in the north is the equivalent of the equatorial rains of northern Australia.

The temperature in most parts of India, therefore, is favourable for all kinds of tropical and subtropical produce. The distribution of plants depends on the distribution of rain. There is no equivalent to the Mediterranean climate and produce of Australia or Africa, except in the extreme north-west, for the temperature of the south-eastern region, which receives rains during the northern winter, is never under 75° F. Owing to the configuration of India, the dry conditions which produce desert, found in Western Australia and South Africa, are confined to the region round the lower Indus. The peninsular part is exposed to the over-sea wind of summer, and only the eastern slopes of the Western Ghats are comparatively dry.

**Economic Divisions.**—The mountain barrier which encloses the north of India is wettest in the east, where it reaches farthest south, and is driest in the north-west. The vegetation therefore becomes less luxuriant from east to west. At the foot of the mountains in the east is a dense useless jungle called the Terai. Sal is the most important timber-tree in the forests of the lower slopes, followed by the deodars and other conifers of the higher forests, above which are rhododendron scrub and meadows moistened by the melting of the eternal snows. Tea is cultivated on the mountain-slopes of Darjiling and Kumaun, the latter in the basin of the upper Ganges. The mountains west of the Indus plain receive very little rain, and that mainly in winter. Wheat, millets, and many

fruits are cultivated in the valleys where irrigation is possible.

The western part of the **great plains** is desert or semi-desert, supporting a few sheep, goats, and camels. Round its edges, where the rainfall is slightly greater, and more particularly where irrigation is possible, wheat, oil-seeds, millets, maize, and even some rice are cultivated, the latter round the lower Indus. Irrigation is well developed in the Punjab and the upper half of the Ganges basin, where wheat is grown as a winter crop, and sugar-cane in summer. Pulses and millets are also cultivated, and some rice in the moister parts at the foot of the mountains. Cotton is grown along the Jumna, and indigo between the Jumna and the Ganges and in the region round the confluence of the Sutlej and the Indus. In the lower Ganges, east of Lucknow and Allahabad, rice is the most important cereal, and sugar-cane, indigo, and tobacco are among the important crops. Opium is grown between Allahabad and Patna, and jute round the lower Ganges and Brahmaputra, and especially on the delta, where the soil, which is quickly exhausted by a crop of jute, is regularly renewed by the flood waters. In Assam, tea is cultivated in the valley of the Brahmaputra, and on the hills to the south, where rubber is also collected.

The **Deccan** may be divided into the western escarpments, which receive heavy summer rains; the drier grass-lands to the east; and the eastern slopes and coastal plains, with summer rains in the north and winter rains in the south. The western mountains and the hills in the wetter east have many teak-forests. Millets (especially jowra and bajra), pulses, and oil-

seeds (linseed and gingelly) are grown in all parts of the Deccan. In the hillier central region wheat flourishes, and cotton is grown south of the Narbada on a rich black volcanic soil which holds moisture easily, as well as in the lowlands of the Kathiawar peninsula. Sugar-cane also grows on this peninsula and in Mysore. Tobacco and indigo are cultivated on the eastern coastal plains. Rice is grown on all the low ground, and even on the hilly lands of the Mysore and the Central Provinces. Tea and a little coffee are cultivated in the Nilgiri and Cardamom Hills, and the cinchona is grown for the protection it affords to the young tea-plants, as well as for the 'Peruvian bark,' yielding quinine. Coco-nut palms flourish round the southern coasts.

In **Ceylon** the mountains are heavily clad with forests, and in the clearings tea, cacao, and cinchona are cultivated. Rice is of importance on the coastal plains, where the coco-nut and Palmyra (sugar-yielding) palms flourish, and cinnamon and tobacco are cultivated.

The hills of **Burma** are covered with immense forests of teak. Rice is the principal crop of the plains, where tobacco, millets, and pulses, and in the north some cotton and wheat, are also grown.

**Minerals.**—**Salt** is the most important mineral in India. The greater part is obtained by evaporating sea-water in the Rann of Kutch, on the Bombay coast in the west, and on the Madras coast in the east. It is also obtained from Lake Sambhar and other parts of arid Rajputana, and in the mines of the Salt Range of the Punjab. **Coal**, which is little needed for domestic purposes, and used mainly to drive engines, is not

widely distributed. It is found near Quetta, in Baluchistan, at Raniganj and Karharbari, west of the Ganges delta, in Bengal, at Umaria in Rewa, Singareni in Haidarabad, and Makum in Assam. Some **petroleum** has been found in Burma. **Iron** is widely distributed, the most important ores being found at Salem, in Madras. It has been proposed to smelt these at or near Calcutta with Bengal coal. **Tin** is mined in the north of the Malay Peninsula. **Gold** is found in Mysore. **Precious stones** come from Burma and Ceylon, Burma rubies and Ceylon sapphires being celebrated.

**Manufactures.**—A country so populous as India naturally requires an immense supply of manufactured articles of many kinds. The great bulk of these is provided by native labour. In the nineteenth century, however, vast shipments of textiles, especially cottons and hardware, were made from the factories of Europe, especially from the United Kingdom. Towards the end of that century numerous factories were built in India itself to manufacture locally-grown cotton and jute into cloths. In addition to the advantages of producing the raw material and having a large market for the manufactured goods, India has plenty of cheap labour. Its disadvantages are (1) that this labour is not nearly so efficient as that of Europe, and in the long-run is almost as costly; (2) there is no local supply of coal in and around Bombay and Poona, where most cotton is manufactured; and (3) during the dry season the air is too dry for successful spinning, and has to be artificially moistened. Cotton is also made in Bengal, but the manufacture of jute at Howrah, a suburb of Calcutta, is more

important. There are also a few modern woollen and paper mills.

**Means of Communication.**—The rivers of southern India fluctuate greatly in volume in the dry and wet seasons, and enter the sea across flat deltas, so that they are of little use as means of transport, although invaluable for irrigation.

The Indus has a swift current and many shifting sand-banks, and can be used only by very shallow craft. The Ganges, on the other hand, is navigable to the very base of the mountains at Hardwar. The Ganges Canal, the upper part of which joins Hardwar to Cawnpore, and the lower part to Allahabad, with several thousand miles of branches, is used for irrigation, and on its main course also for navigation.

The Hugli is the distributary of the Ganges most used for navigation. It has a strong bore and many shifting sand-banks, and is kept open for ocean vessels as far as Calcutta only by constant dredging.

The Irawadi is navigable for river steamers as far as Bhamo, near the Chinese frontier. Ocean vessels sail by its western distributary to Bassein, and by its eastern one to Rangoon. The Salwin is navigable only for about eighty miles. Moulmein is the port on its left bank.

**Railways.**—The railway system of India is rapidly being extended. Two gauges are used—the standard (5 ft. 6 in.) gauge and the mètre gauge. Standard-gauge lines run from Karachi to Lahore and Peshawar through Multan, over which the produce of the Punjab is brought to the coast. An important branch runs through the Bolan Pass and Quetta to the Afghan frontier. From Bombay a railway runs northward

through Surat and Baroda to Ahmadabad. A second line passes through the Khandwa Gap in the Satpura Mountains to Allahabad and Cawnpore. A third runs south of the Satpura Mountains through Nagpur direct to Calcutta. A fourth connects Bombay and Madras, and is continued across the peninsula to Calicut by the Palghat Gap. There are many metre-gauge lines in the southern part of the Deccan, which reach the west coast at Goa. From Calcutta a standard-gauge line skirts the east coast to Madras. Another runs by the Ganges and Punjab to the north-west frontier, with many branches to the foot of the hills, and with a mountain railway to Darjiling and to Simla, the headquarters of the Government during the rains. The Bengal and Assam lines are being connected with those of Burma, which run from Rangoon through the Sittang valley and Mandalay to Bhamo. A short line follows the Irawadi from Rangoon to Prome. A railway is built in Ceylon from Colombo to the tea-plantations in the mountains.

**Irrigation.**—The Indus is to Sind what the Nile is to Egypt, and a great network of canals makes it and the Punjab fertile. The Ganges Canal, from Hardwar to Cawnpore, on the right bank of the main river, is 1000 miles long, with several thousand miles of branches, which irrigate the Doab (the region between two rivers) between the Ganges and the Jumna. The deltas of the great eastern rivers Mahanadi, Godaveri, Krishna, and Kaveri (Cauvery) are all canalised. Artificial lakes have been formed, and wells have been sunk in many parts for irrigation purposes. At least between three and four million acres of India are rendered fertile by irrigation.

**Trade.**—The land frontiers of India are difficult to traverse, and the trade carried over them is small.

From Quetta, goods of eastern manufacture are sent to eastern Persia by Seistan. Trade with Afghanistan is carried on from Quetta with Kandahar, and by the Khaibar Pass with Kabul. Leh, on the upper Indus, trades with Chinese Turkestan over high passes more than two miles above the sea-level, but the trade is declining, owing to Russian competition. Cottons, mainly brought from Europe, are the chief import, and hides, skins, and carpets, and the drug charas, are the chief exports across these frontiers. The most trade with Tibet is carried on by the Chumbi through the frontier port of Yatung, and is slightly increasing. Some trade is done with eastern China through Kunlong Ferry.

The main trade of India, however, is sea-borne. In spite of its immense population, India exports large quantities of food-stuffs, more particularly wheat, that from the Punjab passing through Karachi, that from the Deccan through Bombay. Little rice is available for export in Bengal, but great quantities are shipped from the less densely peopled Burma. Tea from Assam and Darjiling, indigo, opium, jute, oil-seeds, and hides are exported from Calcutta. The tea, coffee, and tobacco of southern India are exported mainly from Madras. Cotton is one of the chief exports of Bombay. Cotton manufactures, hardware, machinery, and railway plant are by far the most important articles imported; next come sugar, provisions and drinks of all kinds, chemicals, silk and woollen goods and apparel.

Most of the import and export trade is with Europe, especially with the United Kingdom. It is increasing with Germany, and also with America, Australia, and Asia.



Ceylon is a Crown colony, and is politically separated from India. Metals, machinery, coal, and cotton goods are the chief imports. Ceylon tea is the chief, but cacao, quinine, spices, plumbago, and copra are minor exports from Colombo.

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## CHAPTER XIII.

### CENTRAL AFRICA AND INTERTROPICAL SOUTH AMERICA.

THESE continental lands agree in possessing a very hot and in most parts wet climate, favourable to the growth of dense forests in the lowlands, and rich savanas on the uplands. At present spontaneous forest growths (more especially rubber), ivory (in Africa), and hides are of economic importance. The unhealthy climate hinders the development of the lowlands by the white man, who has, however, formed some plantations in the higher regions worked by negro or imported coolie labour.

#### CENTRAL AFRICA.

**Position and Configuration.**—Central Africa may be defined as lying between 15° N. and S. of the equator, between the Zambezi, the Niger, and Lake Chad. It consists of the Eastern Plateau of the Great Lakes and Abyssinia, over 4000 feet high; the Western Plateau of the Guinea Highlands; and the basins of the Zambezi, Congo, Upper Nile, Shari, and Niger.

The coast is regular, and bordered by a low plain, usually of no great width, above which the land

ascends by steep escarpments to the plateau. The coastal plain, however, extends a considerable distance up the Zambezi and Niger valleys, both of which are difficult of access from the sea, from the shallowness of the distributaries of their mangrove-fringed deltas, and the dense, wet jungles of their lower basins. The Congo, on the other hand, enters the sea by a deep estuary, but the passage up the river is barred by a succession of magnificent cascades and rapids. Once the higher ground is reached, both the Niger and the Congo offer extensive waterways, to which the great lakes of the East African Plateau must be added. Railways are now being built from the coast to these internal waterways, and are described in the pages which follow.

**Climate and Vegetation.**—Throughout this region the air is always hot, except on the higher plateaus, where it is often cold at nights. Near the equator there are two dry and two wet seasons, the latter occurring when the sun is nearest the zenith at noon—that is, near the two equinoxes. Between Victoria Nyanza and Tanganyika there is no completely dry period. Towards the northern and southern limits of the region the rainy season occurs at midsummer, while midwinter is dry. In the lowlands the rainfall is plentiful, and round the Guinea coast it is very abundant. Here the dense tropical forests are found. The higher plateaus have a much smaller rainfall, and are grass-lands (savanas) with wooded belts along the river-courses, and clumps of trees in the moister regions between the rivers.

**The Congo-Zambezi Plateau** is a rich savana-land, with dense river-woods. It is supposed to contain

many economic minerals. At present it is practically unoccupied by the white man except in the Nyasa region and in the extreme west. In both coffee flourishes, and other tropical plants are cultivated on a smaller scale. Ivory is still obtained from the interior. In most regions roads are absent, and goods are carried by porters over narrow footpaths. A road has been cleared between Lakes Nyasa and Tanganyika, and other roads have been made in southern Nyasaland. That to Chiromo on the Shire connects with the steamers plying on the lower Zambezi, most of which use the Chinde distributary to reach the sea. A short railway connects St Paul de Loanda with the coffee plantations of Ambara, in Portuguese West Africa. Politically the plateau is divided between Portugal and Britain.

**Portuguese West Africa**, or **Angola**, lies in the west. It is dry along the coast, but wetter on the loftier highlands, where coffee is cultivated. Its main exports are coffee, rubber, vegetable oils, coco-nuts, and sugar, exported through St Paul de Loanda, Benguela, and Mossamedes.

North of the upper Zambezi is **Northern Rhodesia**, formerly known as British Central Africa, administered by the British South African Chartered Company, and subdivided into North-western and North-eastern Rhodesia. It is little known and practically quite undeveloped. It must not be confused with the **British Central African Protectorate**, or Nyasaland, which lies to the east of Northern Rhodesia and to the west and south of Lake Nyasa, and is one of the most successfully organised and administered of intertropical colonies. Coffee is successfully grown, especially on

the Shiré Highlands, and rice, wheat, and other cereals are cultivated. Blantyre is the chief settlement.

**Madagascar** is a large island off this coast, twice the area of the United Kingdom. Its mountains run from north to south, and are steepest on the eastern, which is also the wettest and most densely forested side. Savanas prevail on the summit and in the south-west. The forests yield rubber, cattle feed on the grass-lands, the cultivated area produces all kinds of tropical plants, and the mineral wealth is believed to be great.

Gold, raphia fibre, india-rubber, cattle and hides, wax and vanilla, are the chief exports. The British trade, which was formerly very important, has been reduced two-thirds since the island became French. The chief ports are Tamatave in the east, and Majunga in the north-west.

**The Plateau of the Great Lakes** is over 4000 feet high, and is relatively dry. It is an open savana, which feeds immense numbers of cattle and sheep. Millet is the principal grain cultivated. In the lower lands round the Victoria Nyanza the banana flourishes. The highlands to the east, rising to greater heights, are relatively healthy, and it is believed that the Nandi plateau of British East Africa is suitable for European settlement. The wet and malarial east-coast plain produces rubber.

The islands of Zanzibar and Pemba are noted for their spices, especially cloves.

Politically, the plateau is divided between Portugal, Germany, Britain, and Italy.

South of the Rovuma and east of Lake Nyasa is

**Portuguese East Africa**, which extends up the Zambezi valley. The chief ports are Quilimane, the port of the Zambezi, and Mozambique. From Beira, south of the Zambezi, a railway is built to Southern Rhodesia. South of the tropic of Capricorn, Delagoa Bay, with its port Lourenço Marques, is also within Portuguese East Africa.

**German East Africa** lies between the Rovuma and the Umba. Rubber, ivory, and horns are the chief exports. Many plantations have been formed on or near the coast, where coco-nuts, coffee, cacao, vanilla, and other tropical plants are grown. The ports are Dar-es-Salaam, the capital, and Pangani. A short railway runs from Tanga to Pongwe.

The British territories consist of the protectorates of (a) Zanzibar; (b) British East Africa Protectorate, between the Umba and Juba Rivers; (c) Uganda, round the Victoria Nyanza; (d) British Somaliland, south of the Gulf of Aden.

The town of **Zanzibar** is the commercial centre of East Africa.

**British East Africa** is opened up by a railway from Kilindini, one of the two ports of Mombasa, which runs by Kibwezi and Nairobi to Kisumu and Port Florence on Victoria Nyanza (570 miles).

Transport from the coast to the lake, which was formerly done by porters and took several weeks, is reduced to three days. The present exports are ivory, rubber, cattle, hides, and gum.

The **Uganda** region is fertile round the Victoria Nyanza, and is rich in minerals, especially iron and copper.

The **Somali Peninsula**, partly Italian, partly British,

is grass-land, in some parts very poor. It is a pastoral land, and also produces myrrh and other fragrant woods. The British ports are Berbera and Zeila.

The valleys of the **Congo Basin** are all covered with dense forest, supplying rubber. The higher ground between the river-courses is less densely wooded and better peopled. The chief exports are rubber and ivory; the imports are cotton goods and hardware.

On the Congo estuary are the ports of Banana, Boma, and Matadi, above which there are numerous rapids. A railway joins Matadi to Leopoldville on Stanley Pool, above which the river is navigable as far as Stanley Falls. All the tributaries within the circle of which this is a diameter are navigable, affording over 6000 miles of waterway. Near the 2000-foot contour line nearly all the rivers have rapids, which prevent communication by water with their upper courses, many of which have also long navigable reaches.

Most of the Congo basin south of the Ubangi-Welle and the main river from Stanley Pool to its mouth forms the **Congo Independent State**. It is bounded on the north by French Congo.

The **Guinea Coast** is one of the hottest and wettest regions in the world. The forests are consequently very dense, and the climate most unhealthy for all men, especially for Europeans—who have called parts of it the 'White man's grave.' This unhealthiness is a serious difficulty in the way of its being opened up by Europeans, who in the twentieth as in the fifteenth century are here still mainly traders.

The local trade is in palm oil and kernels and india-rubber. Coffee plantations flourish in Liberia,

and have been planted in the German Kamerun colony, but most of the produce is still the natural growth of the forest. Any cultivated or manufactured articles at the ports have come across the unhealthy forest belt from the fertile and relatively healthy savanas of the Sudan.

The British colonies in West Africa are Northern and Southern Nigeria, Lagos, the Gold Coast, Sierra Leone, and Gambia.

**Northern Nigeria** lies in the Sudan, and is discussed on pages 119, 120.

**Southern Nigeria** consists of the lower deltaic portion of the Niger basin, of which Asaba, at the apex of the delta, is the capital. It exports rubber, palm-oil, and oil-seeds from Akassa and other ports.

**Lagos** is an island, and with the adjacent coastal lands west of the Niger delta forms a British colony and protectorate. Lagos is the chief port of the lower Niger basin. A railway connects it to the mainland, and runs for 122 miles to Ibadan, with a short branch to Abeokuta.

The **Gold Coast** still deserves its name, for gold is obtained from the sands of its shores, as well as inland. Railways are being constructed towards the gold-mines and the higher lands of Ashanti from Sekondi. Akra is the chief port.

**Sierra Leone** is bordered by lagoons with much local traffic. The capital, Freetown, is built on the best harbour in West Africa.

The small **Gambia** colony is completely surrounded by French territory.

The **Sudan** is the North African region having a rainy summer and a dry winter season, with rich grass-lands

in the south, and poor grass-lands in the north, passing gradually into the desert. It has greater extremes of temperature, a smaller rainfall, and a more healthy climate than the Guinea coast. It is fruitful and well cultivated, producing sorghum and other millets. Flocks and herds are numerous, and the natives in the Niger basin are skilled workers in leather, as well as expert manufacturers of cloth. It may be divided into three parts—the Western, drained by the Niger; the Central, drained to Lake Chad; and the Eastern, drained to the Nile.

The **Western Sudan** consists of the Niger basin, the upper part of which is French, the lower part British. Of the British Niger protectorates, Southern Nigeria belongs to the Guinea coast region, Northern Nigeria to the Sudan. The natural productions of the Sudan are many and varied. Rubber and palm oil and kernels in the south of the western portion, gums from the desert confines, the manufactured leather and cloth, and even some slaves, from the central populous strip, are exported. Cotton goods, hardware, and vile alcohol are the chief imports, most coming through the Guinea ports. The French have built a railway from Kayes and Bufalube on the upper Senegal to Kulikoro on the upper Niger, which taps much of the trade of the Western Sudan, formerly reaching the Guinea coast or going northward across the desert. Caravans still cross the desert, starting from centres such as Timbaktu, in French territory, at the northern bend of the Niger.

In **Northern Nigeria** are some of the largest towns of Africa, with a flourishing trade entirely in native hands. The Hausas are the great traders of the



Sudan, and their trade-routes extend to the Mediterranean and Red Seas, as well as to the Gulf of Guinea. Sokoto, on the Sokoto; Kano, farther east; Bida, near the bend where the Niger turns southward to its delta; and Yola, at the head of navigation on the important Benué, a left bank tributary of the Niger, are the chief centres.

The Niger is an international waterway, whose chief trading centres, in addition to those mentioned above, are Idda, Asaba, Akassa, and other ports on the delta in Southern Nigeria.

**French West Africa**, in the widest sense, reaches the coast in French Congo, Dahomey, the Ivory Coast (*Côte d'ivoire*), French Guinea, and Senegal, which extend a considerable distance inland, beyond which the greater part of the French Sudan, west of the middle Niger and east of Lake Chad, and the Sahara west of the Tibesti or Tarso Mountains, form the military territories and protectorates of the Chad. These territories are slowly being developed, and the older colonies now pay their way. French Congo is densely forested, and this prevents easy communication from Loango, the chief port, to Brazzaville on Stanley Pool. A railway is projected from Kotonu to Say on the Niger in Dahomey. Grand Bassam is the chief port on the Ivory Coast. French Guinea includes the Futa Jallon Highlands, where cattle are reared. A wharf is being built at Konakry, and a railway constructed to the Niger. St Louis, the capital of Senegal, is joined by railway to the excellent port of Dakar at Cape Verd, and the Senegal River can be ascended to Kayes in the rainy season, from which a railway is built to the upper Niger. The

French are tapping the trade of the upper Niger by this route.

**German Guinea** consists of the Kamerun colony and Togoland. In Kamerun, plantations of coffee, cacao, and tobacco have been made on the fertile slopes of the Kamerun volcano, where an experimental garden has been formed. Kamerun is the capital. In Togoland coco-nut palms and coffee have been planted, and oil and rubber are exported from Lome, the chief port.

**Portuguese Guinea** consists of the Bissagos (Bijagos) archipelago and the land lying to the east; but more important possessions are the productive volcanic islands of St Thomas (São Thomé) and Principe in the Gulf of Guinea, yielding cacao, coffee, vanilla, quinine, and rubber, and Cape Verd Islands, also volcanic, less liberally supplied with rain, but producing coffee.

The **Spanish Islands** of Fernando Po and Annobon resemble St Thomas.

**Liberia** is a negro republic between Sierra Leone and the Ivory Coast, exporting coffee, sugar, palm oil and kernels, and forest produce.

The **Eastern or Nilotic Sudan** is swampy in the flat lower regions round the Bahr-el-Gazal, Nile, and Sobat, where the rivers from the south bring much water during the summer rainy season. The slopes which they drain are a very rich and fertile savanaland, and throughout the region there is plenty of iron. On the other hand, the slopes of Darfur, to the north of the Bahr-el-Gazal, have only a short rainy period, are arid, and gradually pass into desert. Gums are here the chief economic product. The Nile is navigable throughout this region from the foot

of the falls at Lado to Khartum, but occasionally navigation is interrupted by masses of vegetation—the sudd—which block the river. This region is now controlled by Anglo-Egyptian authorities.

The Abyssinian plateau is high enough to have a temperate climate in its upper districts. Rain falls heavily in summer, and the flooded rivers carry away large quantities of the rich volcanic soil, to be deposited as fertilising mud on the plains of Egypt. Tropical fruits, such as the banana, and vegetables, such as sweet potatoes and yam, can be cultivated in the tropical and subtropical valleys; and cotton, coffee, and sugar are also grown. Temperate fruits and cereals are grown at higher elevations. Barley yields the chief crop. Shepherdng, however, for which the country is admirably suited, is the chief occupation, sheep and goats being largely kept. The country is not yet developed in the European sense, and progress is hindered by bad roads and over-taxation. The king claims a tithe of such produce as ivory, coffee, beeswax, and musk. The imports are various kinds of manufactured articles. The French have built a railway from Harar, the eastern trade centre, to their growing port of Jibuti (*Fr.* Djibouti), nearly opposite Aden, at the entrance to the Red Sea.

#### NORTHERN SOUTH AMERICA.

**Configuration and Economic Divisions.**—South America north of 15° S. is bounded by the lofty Andes on the west. The east consists of the lowlands of the Amazon and Orinoco, with the Guiana Highlands and the northern portion of the Brazilian Highlands. It thus contrasts with Africa, the Congo basin lying from

1500 to 2000 feet higher than that of the Amazon. South America is more subject to oceanic influences than Africa, and has a smaller range of temperature and a greater rainfall. The forests of the Amazon and of the north-east coastal plains are even denser than those of the Central African valleys. They abound in rubber, and yield much more timber, which is floated down the great rivers. The deltaic lagoons of the Guiana coast produce excellent sugar.

The Eastern Highlands and the lowlands farthest away from the equator, both with a marked dry season, are savana-lands. Cattle and horses are kept, especially on the llanos of the Orinoco. Coffee is cultivated in the south of the Brazilian Highlands and on the wetter eastern slopes of the Andes. The Andes are so high that products of every climate can be cultivated on their sides. The most important, in addition to coffee, cacao, and sugar round the base, is cinchona.

South America, like North America, is a continent of excellent waterways. The Amazon is navigable for 2300 miles from its mouth to Iquitos for ocean steamers, and for nearly 500 miles higher to Ackual Point at the foot of the Andes for vessels drawing 14 feet of water. Beyond this the Manseriche rapids practically arrest navigation, but occasionally a small steamer ascends them. All the great tributaries are also navigable for a considerable distance from the main river. A line of falls, which can be traced both south and north on any good map, separates the lower from the upper navigable reaches. The Madeira is the most important of the tributaries. The Orinoco and its tributaries, the Apure and Meta, are also navigable, so that the whole of the eastern slopes

of the Andes are most economically reached by the great rivers. The Magdalena and Cauca are routes to the branching ranges of the Colombian Andes from the north. Few railways have yet been built. The eastern states of this region are Brazil, French, Dutch, and British Guiana, and Venezuela. The western or Andean states are Colombia, Ecuador, Peru, and Bolivia.

**Brazil** is a vast country, larger than Australia or the United States without Alaska. It occupies the southern and eastern slopes of the Guianas, nearly all the lowlands of the Amazon basin with their dense wet jungle, and the Brazilian Highlands. The forests yield much india-rubber, but the area from which it is obtained is farther and farther from the main streams, and attempts are made to cultivate it round Pará. Sugar, cotton, tobacco, and cacao are the most important crops of the northern Highlands, and coffee of the regions on or near the tropic, especially of the states of Rio de Janeiro, São Paulo, and Minas Geraes. Cattle flourish on the opener campos. Brazil diamonds were famous before those of South Africa were discovered, and gold, silver, mercury, copper, and many other metals are found, but are little worked. Iron is not smelted owing to lack of good fuel. Cotton and woollen manufacturing is increasing, especially at Rio de Janeiro, the chief town and port, built on one of the most beautiful and commodious harbours in the world. From it many railway lines run across the plateau, one passing through the coffee districts of São Paulo to the port of Santos, from which much of the crop is shipped. In addition to coffee, sugar, and cotton from Bahia and Pernambuco, rubber is exported

from Pará and Ceará. Most of the rubber is shipped to London, whence it is redistributed. Manáos is the rubber-collecting centre for the Middle Amazon. The chief imports are manufactured goods of all kinds, iron and machinery, coal, flour, and various articles of food.

The Guianas produce sugar, cacao, mahogany, gold, and some diamonds. Georgetown, the capital of British Guiana, is the most important centre.

In Venezuela coffee is the staple crop, and sugar ranks next. The slopes of the mountains are cultivated with cacao, cotton, indigo, rice, and, at higher levels, barley. Rubber, excellent timber, and many valuable tropical products, such as copaiba balsam and vanilla, are produced in the forests. Cattle are kept on the vast savanas of the Orinoco. Gold is found in the east of the Guiana Highlands. The chief town is Carácas, only eight miles from its port of La Guaira, which is reached by a railway twenty-three and a half miles long, which zigzags over the mountains. Short lines are built from the coast to Barquisimeto and Trujillo, the chief towns in the west. Maracaibo exports coffee and cacao from the districts around the lagoon of the same name, at the mouth of which it is built. The Orinoco is an excellent route to the interior at present very little used. Venezuela is comparatively healthy for Europeans, but its population is too small for rapid development.

Colombia, Ecuador, and Peru are situated in the western Cordilleran area. The great impediment to their development is the difficulty of transport. In Colombia there are less than 500 miles of railway, and the roads are of the worst description. The Magdalena, which is being partly canalised, is the

most important means of transport. The mineral wealth is considerable. Silver ore, rubber, and sugar are the chief exports; the imports are manufactured goods of every kind. Bogotá, the capital, lies on a lofty plateau. Medellín is the centre of the mining province of Antioquia. Barranquilla, near the mouth of the Magdalena, and Puerto Colombia are the outports of that river-basin. The ports of Aspinwall or Colon on the Atlantic, and of Panamá on the Pacific side of the Panamá isthmus, are connected by a railway and by a half-finished canal (see pages 140–141). **Ecuador** is even more backward in respect of means of communication. Cacao is the chief agricultural product and principal export from Guayaquil, the chief port. Rubber is cultivated, and every sort of tropical produce can be grown. Minerals are abundant, but little worked. A railway is being made from Guayaquil towards Quito, the capital, built on a lofty plateau. Much of western **Peru** is a rainless desert, fertile where irrigated by water from the many rivers from the Andes. Cotton, coffee, and sugar are the chief agricultural products of the eastern slopes of the Andes. The tropical forests supply many commodities of economic importance, such as rubber, dye-woods, and medicinal plants, including the world-famous cinchona or Peruvian bark. Wool is obtained from the sheep, llama, and the alpaca goat, and exported in considerable quantities. Minerals are known to be important, but cannot be profitably worked till better facilities exist for transport. Most of the trade of Peru is done with the United Kingdom, followed by the United States and Germany. The capital is Lima, and its port Callao.

**Bolivia** consists of a plateau, the eastern ranges and slopes of the Cordilleras, and the lowlands at their foot. It yields every variety of produce that Peru does, and is especially famous for its silver-mines and its tin and rubber. The rubber is sent by the eastern rivers, and most of the silver and tin to Antofagasta or Mollendo on the Pacific by railway over the Andes. Most imports come from Germany, which takes but little less of the exports than Britain.

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## CHAPTER XIV.

### INSULAR AND PENINSULAR LANDS BETWEEN THE TROPICS

(Excluding Peninsular India).

THESE differ from the regions described in the last chapter in being islands, and not parts of vast continents. Oceanic influences are all-important. The temperature is uniformly high, and differs little from day to night or from season to season, and the rainfall is usually high.

The East Indies are the insular equivalents of the Congo and Amazon basins. The West Indies and the Philippines, lying nearer the tropic, are the insular equivalents in the northern hemisphere of tropical Queensland.

In the East Indies the native population is large and at different stages of civilisation. In the West Indies the native population has been exterminated and its place filled by negroes of African descent. The West Indies and the northern Philippines can be



settled by whites, but cultivation is entirely carried on by native labour. The exports are tropical timber, fruits and other agricultural products. Cottons and hardware are the chief imports.

### THE INDO-CHINA PENINSULA.

The **Straits Settlements** consist of the islands of Penang and Singapore; Wellesley, the Dindings (partly insular), and Malacca on the Malay Peninsula; and the Federated Malay States, under British protection, of Perak, Pahang, Selangor, and Negri-Sembilan, to which must be added the state of Johore. The centre of the Malay Peninsula is traversed by a mountain-range, from 3000 to 6000 feet high. It is colder and wetter (100 to 200 inches per annum) on its upper slopes than nearer the coast; but everywhere the climate is equable, with cool nights. Rainy seasons occur over the whole region when the sun is at the zenith, and in the east there is also a rainy season when the north-east trades prevail. The forests produce gutta-percha, rubber, resin, rattans, and excellent dye-woods and hard timbers, especially between 1000 and 2000 feet above sea-level. Cattle are reared for draught purposes. Tin is the most valuable mineral product of the Malay Peninsula.

The native Malays are hunters and collectors of forest produce. Most of the agriculture and mining is done by Chinamen and Tamils from southern India.

Railways of *mètre gauge* are made or are being made from the ports of Butterworth in Wellesley, Port Weld in Perak, Klang in Selangor, and Port Dickson

in Negri-Sembilan to a line running parallel to the coast from twenty-five to fifty miles inland, with two long branches to the upper and middle parts of the Pahang River. Bullock-carts carry merchandise beyond the railways.

Tin and spices are the chief exports.

Penang and Singapore are the chief commercial centres and ports of call for steamers passing through the Malacca Straits. Singapore is one of the greatest 'shipping junctions' in the world. It is a free port, in regular communication with Japan and China in the north-east, the Malay Archipelago and Australia in the east and south-east, with India and, by the Suez Canal, with Europe in the north-west, and with South Africa and with Europe by the Sunda Strait in the south.

**Siam** is a mountainous land with alluvial plains occupying the basin of the Menam, and having under tribute the states in the middle part of the Malay Peninsula. It has a monsoonal climate. The most important product of its damp, fertile, alluvial plains is rice; of the dense forests which cover much of the country, teak. Gold, rubies, and sapphires are found, and the mineral wealth is supposed to be very great. Rice and teak are the chief exports, and manufactured articles, treasure, sugar, and opium the chief imports. Bangkok, the capital, is the trading centre on the Menam. A railway joins it to Paknam at the mouth of the river, and is continued to Korat; another is being built northward to Chiengmai; others are projected.

**French Indo-China** consists of Cambodia, Cochinchina, Annam, Tongking, Laos, and the French terri-

tory in China at Kwangchou east of the Leichou peninsula. The Mekong River runs along its western margin, and will form an important route to a yet practically unopened land. The hilly land to the east is well wooded, and supplies teak, camphor, and rubber. Coco-nuts grow round the coast, and the Mekong, Red River, and other deltas are fertile if unhealthy regions, producing much rice, sugar, and cotton. The narrow Annam coast is less fertile, and fish form the chief food of the inhabitants. Coal is mined in Annam (at Tourane) and in Tongking (at Hongay and Kebao).

Saigon, north of the Mekong delta in Cochin-China, is the chief port in the south; Hué, in Annam, is the leading town in the centre; Hanoi and its port of Haiphong are the chief places of Tongking. Great railway construction is contemplated. The chief line already made runs from Hanoi to the Chinese frontier at Nacham, and another is being built beside the Red River to tap the trade of Yunnan in China.

The trade is in rice, exported to the Philippines, Hongkong, and even China, as well as to France. The imports of manufactured goods come mainly from the United Kingdom, United States, and Japan.

#### THE EAST INDIA ISLANDS.

Except Borneo and Celebes, most of these mountainous islands are volcanic. The soil is fertile. Always hot, and almost always wet, they are covered with rich forests on the plains and in the valleys, with open woods and savanas on the higher ground. The coastal lands produce coco-nuts, and the low lands bananas

and tropical fruits, sago, bamboo, and many useful timbers. Coffee, tobacco, sugar, and rice are cultivated.

The **Dutch East Indies** form the most important part of the East India Islands. They consist of Sumatra, Java, part of Borneo, Celebes, the Moluccas, the western part of New Guinea, and the smaller Sunda Islands, with the exception of the eastern part of Timor, which is Portuguese. Java, although not the largest, is the most important of these possessions, and a brief account of it may be applied with modifications to most of the others.

**Java** is a volcanic island about the size of England, with a uniformly high temperature and an abundant rainfall, which is heaviest in the south and west. Its rich soil is very fruitful, and is carefully irrigated, drained, and cultivated, so that this 'garden of the East,' although a purely agricultural country, supports a population resembling in density that of England. A quarter of the land is cultivated. Rice and maize occupy the greatest area. Sago is found in the west, and coco-nuts round the coast. Above the plains coffee, tea, cacao, sugar, tobacco, indigo, and cinchona are cultivated. Coffee, sugar, and cinchona are of especial importance. Since the troubles in Cuba, Java has been the greatest producer of cane-sugar, and it is by far the most important source of quinine. The forests contain many valuable trees, such as teak, bamboo, camphor, and rubber. The higher grasslands support many cattle and buffaloes, whose hides form an important export.

The leading port is Batavia, from which a railway runs to all the chief centres of the island.

**Sumatra** is more extensively covered with dense

forests. Its chief ports are Padang and Benkulen on the west coast.

**Banka and Billiton** have rich tin-mines.

**Dutch Borneo and Celebes** are also largely covered with forest, but are cultivated here and there.

The **Moluccas** have long been termed the **Spice Islands**, and are noted for pepper, nutmeg, and cloves, the last named coming chiefly from the small island of Amboina, to which at one time the Dutch confined their cultivation.

The trade of the Dutch East Indies is mainly with the Netherlands.

**British Borneo** consists of the north-western protectorates of Sarawak and Brunei and the northern lands of the British North Borneo Company. Coconut, coffee, tobacco, Manila hemp, pepper, and gambier plantations have been formed; sago and rice are grown for food; while raw forest produce, especially timber, rubber, and wax, in addition to bêche-de-mer, or trepang, and edible birds'-nests, are the chief natural productions. The mineral wealth is great, including coal, gold, silver, and quicksilver. A short railway runs inland from Brunei Bay. Sandakan, in the north, and Kuching, in the south, are the other important centres.

**British New Guinea** is the south-eastern part of the large island lying off the north of Queensland, to which it is politically attached. The country is densely forested and little opened up. Coco-nuts grow round the coasts, the sago-palm is abundant, and some coffee and tobacco are cultivated. Gold has been found, and in some places is obtained by dredging. Port Moresby is the chief centre and port.

**Kaiser Wilhelms Land**, or **German New Guinea**, lies to the north of British New Guinea, which it resembles in its productions, its possibilities, and its present almost unexploited condition. The plantations include coco-nut, cotton, tobacco, and coffee. Friedrich Wilhelmshafen is the chief port. With German New Guinea we may include the New Britain or Bismarck Archipelago to the immediate east, where the administrative centre of these German territories is situated at Herbertshöhe.

The **Philippines** were formerly Spanish, but now belong to the United States. They lie between 4° and 20° N., and consist of many islands, of which the largest is Luzon, which is mountainous; while Mindanao, the next in size, is at present less important commercially than the smaller Visayan islands of the centre of the archipelago. The eastern slopes receive rains from the north-east trade-winds, the maximum falling in the northern winter; the western slopes receive rains from the south-western monsoons which blow during the northern summer.

The mountains are covered with valuable forests; the sea-coasts produce coco-nut palms. The valleys, especially that of the Cagayan, famous for its tobacco, and that between the bays of Manila and Lingayen, are cultivated. Rice is the chief food crop, but it pays to import rice from Cochin-China. Tobacco, Manila hemp, and sugar are the most important articles grown for export. Much of the tobacco is rolled into cigars at Manila. A railway runs northward from Manila through a fertile valley to Lingayen.

## PACIFIC ISLANDS.

The intertropical isles of the Pacific are either low coral atolls with coco-nut palms, or volcanic islands, which in many cases are girdled with coral-reefs. The temperature is constant and warm, the rainfall as a rule sufficient, and the volcanic islands especially fertile. Copra is the most important product in all the islands, but sugar is cultivated in Fiji, Samoa, and Hawaii, where bananas, rice, maize, cacao, and even tea are also grown.

It is hardly necessary to enumerate all the islands. The Tonga, Fiji, and many smaller islands are British. The most fertile of the Samoan islands are German. France owns Tahiti. Britain and France prevent each other from controlling the New Hebrides. The Hawaiian Islands, part of the United States of America, are the most important group, and with Guam and the excellent Samoan harbour of Tutuila give the chief strategic positions in the Pacific islands to that country. Honolulu in Hawaii, Apia in Samoa, and Suva in Fiji are the most important commercial and transport centres.

**New Caledonia** is an island of a very different type, lying between New Zealand and New Guinea. It has a mountainous axis, in which nickel, cobalt, copper, and chromate of iron are found, and on whose sides are thick forests. Coffee, maize, tobacco, sugar, and practically all tropical products can be cultivated. Minerals, especially nickel, and tinned meats are the chief exports. The trade is chiefly with France. Nouméa is the chief port, and a railway is built from it to the interior.

## THE WEST INDIES.

The West Indies consist of the Great Antilles—the four large islands of Cuba, Jamaica, Hispaniola (divided into Haiti and Santo Domingo), and Porto Rico, the low coralline Bahamas lying north-west of Cuba and mainly north of the tropic, and the Lesser Antilles stretching north and south at their eastern extremity between 10° and 20° N. With the exception of Barbados, which is a low island of coral limestone, the Antilles are mountainous, most of the Lesser Antilles being volcanic.

**Climate.**—Considerable differences of temperature are found at different heights within a small area, but everywhere the daily and seasonal variations are small. The heat is tempered by a sea-breeze during the day, and by a hill-breeze during the night.

The trade-winds prevail at all seasons over the West Indies. February and March are the driest months. There are two rainy seasons, the rainfall being heaviest in May and October in the north, and a month or more later in the south, and in Trinidad there is one maximum in August. The eastern and northern sides exposed to the winds are the wettest.

**Products.**—The windward sides of the islands are wetter, cooler, and more densely wooded than the leeward sides. The forests produce mahogany, ebony, and other cabinet hardwoods and valuable dye-woods. Wide stretches of savana are found in the upland regions. Sugar-cane is almost the only crop in Barbados, Antigua, and St Kitts, and is important in almost all the islands. The cultivation of cacao and



of the banana, pine-apple, and other tropical fruits for the United States and British markets is being extended. Cuba is famous for tobacco. Sugar, rum, and cigars are the chief articles manufactured.

**Trinidad** is a square island with three peninsulas, two formed by the northern and one by the southern mountains. The rainfall is heavy from June till December. Sugar is the chief product, the estates being in the hands of large capitalists. Many cacao-trees have been planted in recent years, and coffee is also grown. Coco-nuts are a source of profit along the sandy shores of the south and east. Mahogany, log-wood, and other timber and dye-woods are obtained from the forests.

A large pitch-lake supplies asphalt, which, with sugar, cacao, and Angostura bitters, is the chief export. Coolie labour is employed, most of the overseers being British. Port of Spain, the capital and chief port, is joined to San Fernando by a railway.

**Barbados** has a climate similar to that of Trinidad. Every acre is cultivated with sugar by negroes, who form the bulk of the dense population and own most of the land. There is a steady emigration of the surplus population from Bridgetown, the capital.

The **British Windward Islands** are Grenada, St Vincent, and St Lucia. **Grenada** grows cacao and some spices and cotton. **St Vincent** produces sugar and arrowroot. The sugar crop was destroyed by a hurricane in 1898, and the sugar industry has not yet been reorganised with efficient central factories. In 1902 there were several violent eruptions of the Soufrière volcano, which destroyed much property and many lives. Live-stock are raised. **St Lucia**

exports sugar and cacao from Castries, one of the best harbours in the West Indies.

Sugar is the most important product of the **British Leeward Islands**—i.e. those of the Lesser Antilles from Dominica northwards which are British. **Dominica** presents a marked physical contrast to Barbados. It is very mountainous and volcanic; but in spite of its fertility, only one-twentieth is cultivated. Sugar is replaced by limes; coco-nuts, cacao, spices, and fruits are also cultivated. There are few good roads. Roseau is the capital. Limes and cacao are grown on **Montserrat**; sugar, coffee, cacao, and tobacco on **St Kitts**; and sugar and pine-apple on **Antigua**.

**Jamaica** is an elliptical island which consists of the Blue Mountains in the east, separated by a valley from the limestone plateau of the west. It is hot in the lowlands and cool on the mountains. Rain falls in the summer months, and most abundantly in the east and north.

The limestone region is bare in many places. The alluvial lowlands are the most fertile part of the island. Cattle, sheep, horses, and mules are fed on the pasture-lands.

Bananas are by far the most valuable crop. Next comes coffee, the best of which is grown on the Blue Mountains, and sugar, now decreasing in importance. Oranges, allspice or pimento, logwood, rum, ginger, and coco-nuts are the other important exports.

Railways join Kingston, the capital, to Port Antonio and Montego on the north coast.

Half the imports come from, and more than half the exports go to, the United States of America; the United Kingdom accounting for less than half the

former, and taking a little more than a quarter of the latter. Trade with the United Kingdom will undoubtedly grow since the establishment of a direct quick service in January 1901. Jamaica owes its prosperity to the variety of the products cultivated. Reliance on sugar alone has long been given up. The breaking up of large estates into small properties cultivated by their owners has added to the wealth of the island.

The **French West Indies** consist of volcanic Martinique, where disastrous eruptions destroyed the northern half of the island and killed over 30,000 people in 1902; and the half-volcanic, half-limestone Guadeloupe, both densely peopled, and producing, in addition to sugar, pine-apples, bananas, cacao, and tobacco.

The **Dutch** own several small islands, of which Curaçao, famous for a liqueur made from the orange, is the most important. It lies off the South American coast.

**Saint Croix**, or **Santa Cruz**, the strategic key to the eastern part of the West Indies, St John, and St Thomas are Danish, but there are negotiations for their sale to the United States.

**Porto Rico**, formerly Spanish, now belonging to the United States, is very fertile, producing sugar, coffee, tobacco, and fruits. These are cultivated by peasant proprietors, the majority of whom are of Spanish descent. The change in political ownership was followed by tariff modifications, which have diverted the trade of Porto Rico to the United States.

**Santo Domingo**, the eastern half of Hispaniola, is peopled by Spanish mulattoes, who cultivate sugar, tobacco, cacao, coffee, and bananas. **Haiti**, the French-

speaking negro republic occupying the west of the island, produces timber, cacao, and coffee.

Cuba, the largest of the Antilles, lies just south of the Tropic of Cancer. The east is the wettest region. The slopes of the Sierra Maestra are covered with forests, in the clearings of which coffee is grown. Bananas flourish in the lowlands, and cattle feed on the rich grass-lands. The central regions are very suitable for sugar-canes. Much of the tobacco, of which the famous Havana cigars are made, is grown on the southern slopes of the Organos Mountains, in the west. The Jurugua iron-mines are in the Sierra Maestra, in the east.

Cuba has not yet recovered from the effects of the many years of war. It was freed from the Spanish yoke by the United States, and is now an independent republic. Few countries are better fitted for producing sugar, and Cuba, if properly developed, might supply a very large part of the world's demand for this article. Trade is mainly with the United States.

Railways connect all the great sugar and tobacco plantations with Havana, the capital. Havana and Matanzas on the north coast, and Cienfuegos on the south, are the chief ports in the western half of the island. Santiago is on a magnificent harbour in the south-east.

### CENTRAL AMERICA.

Central America lies between the isthmuses of Panamá and Tehuantepec. A series of volcanoes runs parallel to the Pacific coast, and a number of ranges extends from west to east in the east. The peninsula of Yucatan is flat. The long rivers flow eastward to the Atlantic.

Three climatic regions can be distinguished—the lowest or hot region (*tierra caliente*), the middle or temperate region (*tierra templada*), and the highest or cold region (*tierra fria*). Most rain falls on the eastern slopes, where the normal zenithal rainy season is supplemented by rains during the north-east trades.

**Products.**—The hot regions of the eastern side are covered with thick forest of valuable timber and dye-woods—such as mahogany and logwood—and rubber. The forests are much less dense and important on the drier western slopes, and give place to open savanas, on which cattle are fed. This is the region where coffee, cacao, sugar, cotton, and fruits are cultivated.

British Honduras exports mahogany and logwood, which, with some rubber, are the staple exports from all the east-coast ports of Central America—Limon, in Costa Rica; Greytown, or San Juan del Norte, and Bluefields, in Nicaragua; Puerto Barrios, in Guatemala; and Belize, in British Honduras.

Coffee and cacao, bananas and hides, are the chief exports from the western ports, which are the most important. The ports are Punta Arenas, in Costa Rica; Corinto, in Nicaragua; Amapala, on Fonseca Bay, in Honduras; La Libertad, the port of San Salvador, in Salvador; and San José, in Guatemala.

The narrow isthmuses of this region permit easy communication between the Atlantic and Pacific. Railways cross the isthmuses of Tehuantepec and Panamá. A great ship-canal is being cut from Colon on the Atlantic to Panamá on the Pacific. It has entailed enormous sacrifices of life and money, and is not yet finished. The climate is very unhealthy, and the engineering difficulties very great,

the most serious being the river Chagres, which is heavily flooded during the rainy season and very difficult to regulate. The canal will probably be completed under the control of the United States of America. It has also been proposed to construct a canal across a depression in Nicaragua, starting from Greytown on the Atlantic and reaching the Pacific at Brito. The canal would utilise part of the course of the San Juan River, which would require to be dammed, and Lake Nicaragua. The lake will act as a regulator in the rainy season and diminish the dangers of flooding; but a volcano, which is not extinct, forms an island in the lake, not far from the proposed steamer track.

### MEXICO.

**Configuration.**—Mexico extends from 15° to 32° N., but, although the northern portion is outside the tropics, it will be convenient to consider the whole country here. It consists of an elevated plateau, rising from north to south, where it is called the Anahuac Plateau. This plateau is bordered east and west by mountain-ranges, the Eastern and Western Sierra Madre, at whose base a narrow coastal plain fringes the ocean. The southern parapet of the plateau is a region of lofty volcanic mountains, which tower above the Tehuantepec isthmus, beyond which the greater part of the limestone peninsula of Yucatan is still in Mexican territory.

**Climate and Vegetation.**—Except in the north, north-west, and centre, where it is very dry, the climate and vegetation of Mexico resemble that of Central America, and the three zones, *tierra caliente*, *tierra*

*templada*, and *tierra fria*, are all found, the last two in greater proportion than farther south.

**Economic Productions.**—Henequin is a characteristic product of the drier regions. Mexico also produces rice, sugar, cotton, coffee, and cacao in the lower slopes and plains, where logwood and timber are obtained from the forests; and higher up maize, wheat, and tobacco. Cattle ranches abound in the north, but the goat, which can live on the very dry herbage which characterises so much of the interior of Mexico, is the domestic animal kept in greatest numbers.

Mexico is exceptionally rich in minerals, especially in silver and gold, and also produces lead, copper, iron, antimony, and many other metals in smaller quantities.

**Trade, Routes, and Towns.**—Minerals, tropical produce, and animals are the chief exports; manufactured articles of all kinds, machinery, and coal are the chief imports. Trade is carried on chiefly with the United States; next with the United Kingdom, France, and Germany.

The chief ports are Vera Cruz and Tampico (where much of the silver is shipped) on the Gulf of Mexico, and Mazatlan (wheat) and Acapulco on the Pacific. Railways run from Mexico northward to the United States, to Manzanillo and Sihuatanajo on the Pacific, and to Tampico and Vera Cruz on the Atlantic. Zacatecas and Guanajuato are among the chief silver-mining centres. A railway runs across the Tehuantepec isthmus from Coatzacoalcos on the Gulf of Mexico to Salina Cruz on Tehuantepec Bay of the Pacific. This line is connected through Vera Cruz to the Mexican railway system.

## CHAPTER XV.

## EASTERN ASIA.

THE east coast of Asia, from the island of Hainan to the north of Yezo, lies between latitudes corresponding to those of Australia between the south of the Gulf of Carpentaria and the south of Tasmania. The physical and economic conditions, however, are very different. The eastern mountains do not form so continuous a barrier as in Australia, but stretch parallel to the coast south of 30°, and from Korea northward. A great plain extends from 30° to 40° N., with the mountains which form the Shantung peninsula rising above it in the east. In the south-west the land rises to lofty mountain-ranges and steep valleys, forming the eastern bulwarks of the Tibetan plateau, whose valleys lie two and a half miles above the sea. The northern plains are bounded by steep escarpments, beyond which stretches the desert plateau of Mongolia, between 3000 and 4000 feet above sea-level. Off the east coast are the East China Sea with its shallow northern gulf, the Yellow Sea, and the Sea of Japan, with islands to the east of them. Formosa in the south, and the Japanese Islands in the north, are represented in the southern hemisphere by New Caledonia and New Zealand, both of which, however, lie much farther from the mainland. In addition to these differences in configuration, there are important differences in climate.

**Climate.**—The climate of Eastern Asia is one of great extremes, except in the very south. Even in



the Japanese Islands the mean temperature varies from 75° to 40° F., and the mean range is from 20° in the south to 70° in the north. The summers are everywhere warm, with a temperature of over 80° in the south, and over 60° in the north. In winter, while the temperature does not fall below 60° on the southern coasts, it is as low as 0° in the north. Much lower winter temperatures, therefore, are experienced than in similar latitudes in the south of Australia.

The east of Asia, like the east of Australia, has its maximum rainfall during the summer months, except on the western coast of Japan, which receives heavy rains from winter storms blowing across the Sea of Japan. These winter rains affect all the southern Japanese Islands, and make the climate of Japan, which has a well-distributed rainfall, very different from that of China, where the rainfall is almost entirely confined to the summer six months.

The summer rains of Eastern Asia, like those of Australia, are due to winds which blow from the ocean to the continent; but whereas in the case of Australia these winds may be considered as the normal trade-winds intensified, in the case of Eastern Asia they are comparable with the monsoons of India. The cold, invigorating winter climate of Eastern Asia, however, is totally unlike that of India.

Destructive typhoons make the South and East China Seas dangerous to navigate in summer and autumn.

It will be convenient to consider the economic geography of this region under its main political

divisions—the Chinese Empire (with special reference to China Proper and Manchuria), Korea, and Japan.

### THE CHINESE EMPIRE.

**China Proper.**—Three great rivers cross China from west to east—the Si-kiang, in the south, flowing under the Tropic of Cancer; the Yangtse-kiang, in the centre, with a course which nearly coincides with the parallel of  $30^{\circ}$  N.; and the Hwang-ho, in the north, which flows in every direction except west between  $35^{\circ}$  and  $40^{\circ}$  N. The Yangtse rises in Tibet, and with its tributaries drains the centre of China, forming the most important route to the interior, as it is navigable for many hundreds of miles from its mouth. South of the Yangtse the country consists of mountain-ranges running from south-west to north-east, between which great tributaries of the Yangtse flow northward, the Yuen and the Siang entering the Tungting Lake, and the Kan entering the Poyang. In the summer months, when the main river is in flood, these lakes act as regulators by receiving a portion of the surplus waters, and thus preventing them from inundating the lower parts of the Yangtse basin, which is relatively flat from a little above the Tungting Lake to the mouth of the estuary. The Han is an important tributary from the north-east.

The Hwang-ho also rises in Tibet. Unfortunately it has no regulating lakes to act as reservoirs, and consequently the river, which flows over 400 miles across the plains before reaching the sea, often floods vast areas, doing havoc both to life and

property. It has earned the double name of 'China's blessing' and 'China's sorrow,' for it is invaluable as a means of irrigating and rendering fertile the northern plains, while its frequent changes of course not merely cause disastrous floods at the time, but also ruin the farms round its deserted course by depriving them of irrigation. The Hwang-ho is shallow and rapid; it flows through deep gorges, and, unlike the Yangtse, is of little use for navigation. The valley of its tributary the Wei-ho, which rises in Tibet and flows due east, is, however, an important route to the west.

Economically, China Proper falls into three divisions: (1) the Si-kiang basin; (2) the Yangtse basin; (3) the northern plains, including the basin of the Hwang-ho, or Yellow River.

**The Si-kiang Basin.**—The basin of the Si-kiang, or West River, lies south of the Nanling Mountains, and corresponds in latitude with the Fitzroy River in Queensland or the Limpopo in South Africa. Tropical vegetation flourishes, but in diminished size, including bananas and other palms, and many valuable timber-trees in the mountain forests. In the valleys rice and sugar are cultivated. Silk is produced in large quantities. A little tea is cultivated in the northern part.

The **Yangtse Basin** corresponds in latitude with the south of Queensland and the north of New South Wales. The climate, however, is more extreme, with very cold, invigorating winters and hot, moist summers, becoming cooler in the west, where the land rises towards the lofty plateau of Tibet. Tea and silk are the most important products of the moun-

tains between the West River and the Yangtse. Rice and sugar are cultivated in the valleys of the Yangtse between the Poyang Lake and the east coast. Opium is grown in all the provinces, more particularly in the west. Camphor, wax, and lac are among the products of the forests.

The **Northern Plains** have a still more extreme climate. In the north of the eastern plains the rivers are frozen in winter, though they correspond in latitude to south Italy, or to south Victoria and north Tasmania. A loose, fertile, yellow soil called loess, blown from the desert, covers much of the plains, and even the hollows of the mountains, which can consequently be cultivated to a very great height. Temperate cereals and grains of all kinds are grown, while the hot, moist summers permit tropical and subtropical produce, such as sugar, indigo, rice, and cotton, to be raised on the same fields, at least south of the Gulf of Chili.

**Minerals.**—At the present time we know little of the mineral resources of China, except that they are very great, especially in coal and iron, the most important minerals in modern industry. Coal is abundant in the mountains immediately west of the great plains north of the Hwang-ho, where the best anthracite and bituminous coal occur in great seams, which, in the province of Shansi, can be quarried. The whole of south-eastern Hunan—that is, the valley of the Siang—may not unfitly be called one great coalfield. Besides these two vast coalfields, in united area greater than the whole of Ireland, coal is found in many of the western mountains, especially in Sechwan. It also occurs in the higher land both north

and south of the Gulf of Pechili. It is worked by the Chinese, more particularly in Sechwan, and in recent years at Kaiping. The mines of Pechili have been worked by European methods. Iron occurs in the Shansi and western coalfields, but is not abundant in Hunan. The south-western district of Yunan is rich in copper, tin, silver, lead, and other minerals, and copper is found to the north of Canton.

**Manufactures.**—China has long been famous for exceedingly fine porcelain, bronze, and textiles. Domestic manufactures of many kinds are carried on. In recent years factories of European type have been started, mainly in and around Shanghai, to manufacture textiles, especially cotton and silk, and munitions of war. In the future China will probably take rank as one of the chief manufacturing countries of the world; and with its command of coal, iron, and cheap labour, its varied products, and its proximity to the sources of many important raw materials, such as wool, cotton, jute, &c., and in spite of the disadvantage of the winter air being dry, it may prove a serious rival to Europe and America.

**Means of Communication.**—Water is the most important means of communication. The Si-kiang is navigable for large vessels as far as Wuchou, beyond which smaller boats continue the navigation almost to the frontier. A canal connects the Si-kiang with the Yangtse-kiang by joining the Kwei, a tributary of the former, to the Siang, a tributary of the latter. A great part of the trade of western and central China passes through the basin of the Yangtse. The main stream is navigable for ocean steamers as far as Ichang,

over 900 miles from its mouth. The favourable period for navigation above Ichang is when the river is low in winter; while below this point flood-time, when the shoals are well covered, is best. Above Ichang are great gorges where navigation is impeded. Smaller steamers can, however, ascend as far as Chungking, the most important river-port in Sechwan, at the mouth of the Kialing. The Kialing and the Min drain this fertile province, comparable with England in its area, population, and the well-being of its people.

The canal system of China is highly developed. Many centuries ago the Grand Canal was constructed across the great plains between Hangchou, on a gulf of the same name, and Peking, the northern capital. This canal unites the lower Yangtse and Hwang Rivers, and although much of it has fallen into bad repair, the section south of the Hwang-ho is still navigable, at least for small boats. The Hwang-ho is of little use for navigation, but the Pei-ho and its tributaries form an important means of communication across the northern portion of the plains, and join Peking to its port of Tientsin.

Railways are as yet of little importance. A short line connects Shanghai with Wusung. The longest line yet built runs from Paoting by Peking, Tientsin, and the Kaiping coal-mines into Manchuria. Many lines are projected between great towns not already connected by waterways. A line from Peking to Hankou is under construction, and will be continued to Canton. Ningpo will be joined to Peking *via* Shanghai, and a line may be carried by the valley of the Wei-ho through Singan to Langchou and the

western frontier. A line from Kiauchou in Shantung is built to Tsinan on the Hwang-ho.

**Trade.**—A considerable trade is carried on overland through Tali-fu with Siam and Burma, through Chengtu on the Min with Tibet, through Langehou with central Asia, and through Peking with Mongolia and southern Siberia.

Many ports are open to foreign vessels, the most important being Shanghai, the outlet for such of the produce of the Yangtse valley as is not shipped direct from Ichang, Hankou, Chinkiang, or other river-ports.

The silk and teas of the fertile south-eastern provinces are sent to many different ports, such as Fuchou, Amoy, and Swatou. The produce of the Si-kiang basin is brought to Canton, on its delta, off which rises the British island of Hong-kong. Kiauchou and Chifu are the chief ports of Shantung. Tientsin is the outlet for the northern part of the plains.

China is mainly self-supplied, but is every year obtaining more of its manufactured goods from abroad. Cotton and hardware are the chief imports. Opium is largely imported from India, but this import is decreasing with the extension of home cultivation. Petroleum is also imported. To foreign markets China exports silk, tea, some sugar, straw, hides, and pottery made from the fine clay found in the Poyang Lake.

Between one-quarter and one-fifth of the inhabitants of the world live in China Proper. The Chinese are a hardy and vigorous race, capable of great endurance, frugal, patient, and persistent. At present they are ignorant of modern methods, but make excellent workmen under European direction.

As merchants they are unsurpassed, and most of the trade of the Far East is in their hands. They are noted for commercial probity. Each *hong*, or association of traders, is liable for the obligations of any of its members, and defaulters are rare.

China is so vast a country, with such diverse climatic and economic conditions, that it may well remain self-supporting. As railways develop, however, its external trade should increase. The possibilities of China proving an economic rival have already been alluded to.

**Manchuria** is a great undulating lowland, lying between the Khingan Mountains and the mountains which form the northern border of Korea. It is drained in the north by the Sungari and its tributaries, and in the south by the Liao. The extremes of temperature are very great. The winter is cold, and the soil is frozen for four months. At the end of March ploughing begins. Wheat and barley are sown, and are harvested before midsummer, and a crop of millet or beans is planted in time for the summer rains.

'Millet is the chief food of the people, but much wheat is grown in the north; barley is cultivated for distilling; maize, root-crops, vegetables, opium, tobacco, and many fruits are raised. Beans are used not merely for food but for the oil, expressed under great granite wheels. The mountains, especially in the south and east, are covered with forests, which consist of deciduous trees at low levels, and of conifers at greater altitudes. Many trees are felled, and the logs are floated down the rivers, especially the Sungari, to the plain.



'The Chinese of Manchuria are farmers in summer and carters in winter, when transport by cart or sledge is easy over the frozen soil. Conveyance by cart is necessary, as in this hilly land the rivers are rapid, and not very navigable, although both the Sungari and Nonni might be much more used than they are.

'Niuchwang, near the mouth of the Liau River, is the chief port, through which beans, oil, maize, cereals, tobacco, hemp, and other products are sent. The chief imports are textiles, oil, hardware, and sugar. It is joined to Dalnyi and Port Arthur in the south, and to Mukden farther north, through which the line is continued to join at Kharbin the line from Vladivostok, which is carried through Tsitsihar to Kaidalovsk, on the Upper Amur.

'Chinese immigration is constant, and has resulted in the agricultural development of the two southern provinces, while most of the northern ones still remain to be broken by the plough. As a whole the people are prosperous peasants, living on their own property. Want is felt only in times of famine or flood. The taxes are said to be the lightest in the world.'\*

**Korea.**—Korea is a mountainous peninsula with a steep slope to the east, and a gentler slope westward to the Yellow Sea, in which lie innumerable islands. The eastern slopes, which receive much more rain than the western, are covered with dense forests. There are fine pasture-lands in the west. The southern plains grow rice, maize, beans, tobacco, and cotton; while those of the north produce cereals and root-

\* Article in *School World*, Jan. 1901, p. 21, by A. J. Herbertson.

crops of temperate lands, such as barley and potatoes. Ginseng is in great demand for export to China, which also takes rice and beans. Gold is found and mined. Between £300,000 and £400,000 worth was exported in 1900. Coal, iron, and copper are known to exist, but are not yet exploited. Textiles and hardware are the principal imports. The chief ports are Chemulpo in the west, Fusan in the south, opposite Japan, with Gensan in the Broughton Bay in the east. The country, however, is still little opened up, although the Japanese and their rivals, the Russians, are striving to control its great resources.

### JAPANESE EMPIRE.

The Japanese Empire extends from the south of Formosa, south of the tropic, to the north of the Kurile Islands, 50° N.

**Formosa.**—Formosa is mountainous, and receives heavy rains from the trade-winds on its eastern slopes, which are densely forested with camphor and other useful trees. On the western plains rice, sugar, and tea are cultivated.

The chain of the **Luchu (Riukiu) Islands**, which produce sugar and rice, connect Formosa with Japan Proper.

The **Japanese Islands** consist of four large and many small islands, lying between 30° and 45° N.—that is, almost in the latitudes of New Zealand. The mountainous northern island of Yezo, or Hokkaido, corresponds in latitude with the Middle Island of New Zealand, but is smaller and has a colder winter. It is thickly forested.

The wealth of Japan is concentrated in the southern islands, Honshiu (Hondo), Shikoku, and Kiushiu. All are very mountainous, with loose volcanic soil, which is easily carried away by the rivers when in flood. The climate is extreme, especially in the north of Honshiu. Most rain falls in summer, except on the western slopes, where snow falls heavily in winter, borne by the north-west winds across the Sea of Japan. The north of Japan is covered with woods, in which camphor, lacquer, wax, paper, and mulberry are the most important trees. Two-fifths of the land is under cultivation, more than half the cultivated area producing rice. Barley, millet, pulses, and other foods are grown, and in central Japan are great tea-plantations.

‘Agriculture is the chief occupation of the Japanese, and they are very careful farmers, thoroughly understanding cropping and the rotation of crops. The soil is not naturally very fertile, being mostly volcanic or derived from igneous rocks, but it is made productive by careful manuring, especially with night-soil from the villages and towns. Rice is the staple production, while barley, millet, wheat, buckwheat, maize, and many varieties of beans and peas are also everywhere produced. The rice harvest commences in September; wheat is sown in drills in November and December, and is reaped in May and June.’\*

Cotton and tobacco are also grown, and silkworms are reared.

**Minerals.**—Silver, copper (found at Ashio, not far from Nikko), antimony (obtained in Shikoku), and iron

\* *Chambers's Encyclopædia*, vol. vi. p. 283.

are the chief metals. Coal is plentiful. The most important coalfields are near Nagasaki in Kiushiu and Poronai in Yezo (Hokkaido). Sulphur, petroleum, and fine clay for porcelain are also utilised.

**Manufactures.**—Japan has long been famous for its manufactures, among which are exquisite tissues, porcelain (especially near Nagoya), bronzes, hardware, and wooden and lacquer ware (at Kyoto and Tokyo). Japan opened its doors to foreign influence a generation earlier than China. Its manufactures on modern lines are considerably developed, especially at Ozaka (cottons) and Tokyo, but the artistic quality has declined. Silk, cotton, wool, sugar, paper, glass, matches, chemicals, machinery, and even ships are now made by modern methods.

**Trade.**—Japan has a large foreign trade. Silk and silk manufactures are the chief exports, followed by cotton-yarn, coal, copper, tea, and matches. Japan imports a large proportion of the raw cotton it manufactures, as well as cotton and woollen goods, sugar, iron and steel, arms, and petroleum.

‘The principal exports to Great Britain from Japan are rice, copper, silk tissues (*habutæ*), silk handkerchiefs, raw silk, porcelain, earthenware and lacquerware, carpets, straw mats, and camphor. An enormous rise in the quantity of copper sent is to be seen from the returns.

‘The United States used to be an excellent customer of Japan, but only supplied in return a limited quantity of commodities. During the past few years, however, this state of things has changed, and although America still remains the chief market for Japan’s staple products, the former now competes

successfully for a large share of the import trade of the latter.\*

**Means of Communication.**—Few parts of Japan are more than sixty miles distant from the sea, and the coasting trade is very important. A railway runs from Nagasaki, in Kiushiu, through a coal-mining region to the growing port of Moji, opposite the port of Akamagaseki, on Honshiu, from which a railway runs along the whole of the south and east coasts to Aomori, in the extreme north of Honshiu, connecting the important ports of Kobe, Ozaka, and Yokohama, and the ancient and modern capitals, Kyoto and Tokyo. In Yezo the chief port is Hakodate, and a railway runs from Saporu to the Poronai coalfield.

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## CHAPTER XVI.

### THE RUSSIAN EMPIRE.

THE vast Russian Empire, nearly 9,000,000 square miles, or more than seventy times the British Isles, in area, stretches from 35° N. to beyond the polar circle, and from the Baltic to the Pacific. It lies farther north than any of the lands yet considered, with the exception of Canada. The Crimea and Transcaucasia correspond approximately with the Lake peninsula of Canada, the great plains of Siberia with those of central Canada, and the Amur highlands with those of British Columbia. The Transcaspian, or Turkestan, provinces have no analogue in Canada.

\* *Board of Trade Journal*, vol. xxix. p. 209.

**Asiatic Russia.**

**Amuria and Siberia.**—Amuria consists of the forested Trans-Baikal plateau and the eastern mountain region drained to the Pacific. Its climate is one of great extremes. The rainfall is heavy near the coast, but small in the interior.

Siberia extends west to the Urals as a vast lowland, drained to the Arctic Ocean. It is crossed by the great rivers Lena, Yenisei, Ob, and their tributaries. All are navigable for many hundreds of miles in summer, but are ice-bound in winter. The two latter have vast estuaries opening into the Arctic Ocean, which can be reached by vessels from Europe in favourable summers, and which might perhaps be kept open every summer by means of ice-breakers. The climate of Siberia is drier and even more extreme than that of Amuria. In the north the surface consists of tundra, where the frozen soil produces only dwarf vegetation, in which lichens predominate. This zone is succeeded to the south by a forest zone, giving place in its turn to grassy steppes gradually passing into desert.

Both Amuria and the mountains of southern Siberia are rich in minerals. Gold is found in the Altai, the Trans-Baikal plateau, and the eastern mountains of Amuria. Coal is known to exist east of Lake Baikal and near the Usuri, but is as yet little worked.

The economic development of Siberia is only beginning. Half a century ago it was little more than a penal settlement, but since the opening of the Great Siberian line its colonisation by Russian immigrants is proceeding rapidly. The steppes are fast

being covered with immense crops of wheat, in the same manner as the opening of the Canadian Pacific line led to a rapid extension of wheat-growing in the corresponding plains of Canada.

The **Great Siberian line**, now under completion, is the longest direct line in the world. Its present Pacific termini are Port Arthur and the commercial port of Dalnyi, both on the Liautung peninsula, and Vladivostok, on the 'Golden Horn of the East.' In addition to the line through Manchuria (see page 152), another runs from Vladivostok to Khabarovsk, on the Amur, where passengers and freight are transferred to steamers and carried up the river past Blagovvestchensk, the chief and rapidly developing commercial centre, to Stretensk, from which the railway runs due west to Kaidalovo, near Nerchensk, where it joins the main line from Manchuria. The line, still running west, curves round the south of Lake Baikal to Irkutsk,\* the most important town of central Siberia; and nearly coinciding with the parallel of 45°, passes through the growing towns of Krasnoyarsk on the Yenisei, and Omsk on the Irtysh, to Chelyabinsk in the southern Urals, where it divides, one branch passing west through Samara to Moscow and St Petersburg, the other north through Perm to Kotlas on the Northern Dvina, which in summer is navigable to Archangel, to which the line will ultimately be extended.

'Among **export** freights from Siberia, the first place is taken by corn (42 per cent.), which is sent principally to the European market through the ports of

\* This section is not quite completed round the south of the lake, across which great ferry-boats ply.

Reval, Libau, St Petersburg, and Riga. Next comes the produce of cattle-raising, &c.—meat, butter (chiefly for the London market; sent in special refrigerator wagons), tallow, hides, wool, eggs, and game. Of goods in transit, tea as yet forms the principal item (1897, 28,000 tons; 1898, 36,000 tons). The chief commodities brought into Siberia by the new railway are iron and ironware, sugar, cottons and woollens, machinery, and petroleum.\*

**Russian Central Asia.**—Russian Central Asia is a desert fertilised by rivers which have their source in the melting snows of the surrounding mountains, bordered on the north by the zone of the Steppes. The Syr Daria and its tributaries create the fertile regions of Ferghana and Tashkent; the Zerafshan, the oases of Samarkand and Bokhara; the Amu Daria, the oasis of Khiva; and the Murghab, the oasis of Merv. The winters are long and very cold, but the summers are so warm that cotton is the most important crop under cultivation, covering over half a million acres in Ferghana. Rice, maize, and sorghum are summer, and wheat and barley are winter, crops on the oases, and every kind of Mediterranean fruit can be grown; and the silkworm is reared, especially in Bokhara and Ferghana. On the steppe-lands are many flocks and herds, which yield hides and wool. The minerals are numerous, but are as yet scarcely utilised. A railway connects Tashkent, Andijan, and Kokan by Samarkand and Bokhara with Krasnovodsk on the Caspian, tapping the trade of north-east Persia at Ashabad. A line is being made from Tashkent across the Steppes to

\* *Board of Trade Journal*, vol. xxix. p. 546.



Orenburg which will connect it with the Russian railway system.

**Transcaucasia.**—Transcaucasia lies south of the Caucasus, and extends east to Ararat and the middle Aras. Its climate is less severe than that of Central Asia, the Caucasus acting as a barrier to the cold north winds. The rainfall is very low east of Tiflis, the capital and chief town, but is heavy in the western Caucasus. The mountains are forested. Cultivation is carried on in the valleys. Tea has been planted on the slopes of the Caucasus, but the scarcity of labour militates against its success. Every kind of Mediterranean fruit, including the vine, can be cultivated. Some cotton is grown, more particularly in the south.

The Baku region is rich in petroleum, which is either sent across the Caspian to the Volga by steamers, which make use of it as fuel, or is carried by huge pipes for a distance of five hundred miles to the Black Sea ports of Batum and Poti.

### **European Russia.**

**Configuration.**—European Russia is a vast undulating plain, extending 1700 miles from north to south, and 900 miles from east to west. Across this plain flow the longest rivers of Europe—the Volga to the Caspian, the Don to the Sea of Azov, the Dnieper (with falls near its mouth) to the Black Sea, the Western Dvina to the Baltic, and the Northern Dvina to the White Sea.

**Climate.**—There is great diversity of climate, varying from Arctic conditions in the north, where the winter lasts for many months and the rivers are ice-bound, to a Mediterranean climate in the southern

Crimea. Russia may be profitably compared with Canada, from Lake Erie to the Mackenzie delta.

**Vegetation Zones and Productions.**—The tundra of the Arctic coast is succeeded to the south by coniferous forests, which stretch from the Gulf of Finland to the south of the Urals. South of the conifers come forests of mixed woods, extending from the north of the Karpathians to the confluence of the Kama and the Volga. Still farther south are grassy steppes, passing into desert salt steppes towards the south-east. The southern boundary of the forests agrees with that of morainic soils, while the steppe-lands are covered with loess, which, when mixed with humus, forms a rich black earth.

One-fifth of the surface of European Russia is unproductive; nearly two-fifths are forested; the remaining two-fifths consist of meadow and arable land. More than one-fourth of the whole surface is under cultivation. The extreme north and the extreme south-east are pastoral. The reindeer is kept on the tundra; sheep, cattle, horses, pigs, and goats on the steppes. In the clearings of the coniferous forests the principal cereal is oats, with the addition of wheat in the Kama basin. Flax is grown in the west, and hemp in the centre of this zone. In the south-west, near the Karpathians, and between the Oka and the Dnieper, large crops of sugar-beet are raised. Except in the south-east, the steppes are composed of fertile black earth (*chernoziom*), and form the great wheat-growing region of European Russia. Flax is also cultivated in the *chernoziom*, as well as along the lower Don and in Bessarabia. The vine flourishes in the Crimea and along the Kuban. Rye is grown everywhere for

food, except in the salt steppes of the south-east, where the rainfall is too scanty.

Russia is well supplied with **minerals**. The Urals are exceedingly rich in both precious and useful metals, including platinum, gold, silver, copper, iron, and coal. The most important coalfields are those of the Urals, the Oka (of which Tula is the centre), the Donets, and Poland. On all these iron is plentiful. Lead and zinc are found in Poland. Salt is obtained from the salt lakes and seas, and in the centre and north from rock-salt.

In **manufactures**, the domestic industries are still the most important, almost every article, from the coarsest to the finest, being produced, generally under some system of co-operation. In recent years, however, there has been a great extension of the factory system, more particularly in the Moscow district in south Russia and in Poland round the coalfields, and at St Petersburg. Many of these factories are financed by foreign capital—German in Poland; British, Belgian, and French in south Russia. Cotton (the most important), wool, and hemp are the chief textiles manufactured. Iron and engineering works are increasing in number. Spirits, soap, candles, paper, earthenware, tobacco, and many other manufactures are increasing rapidly.

**Trade, Towns, and Routes.**—With the industrial development of Russia, the population, which already numbers nearly 110,000,000 in Europe alone, is increasing very fast, more especially in Poland and in the south, where the towns are growing very quickly.

In the matter of internal communication, Russia is magnificently supplied with lakes and navigable rivers,

the only drawback being that they are frozen during the winter months. The Volga, the longest and most important river of European Russia, is connected by canal with the great lakes in the north-west.

St Petersburg, the capital, on the canalised Neva, is an important manufacturing and commercial centre, its trade being largely in German hands. Moscow, in the heart of the country, the physical, ecclesiastical, political, and commercial centre of the empire, stands at the head of navigation on the Moskva, which flows into the Oka, a tributary of the Volga. From Moscow railways radiate in all directions, connecting it with Vienna, Berlin, and St Petersburg, and the ports of Archangel on the White Sea, Port Arthur and Dalnyi on the Pacific, Petrovsk and Baku on the Caspian, and the various Black Sea and Baltic ports. The main line to the south passes through the manufacturing and mining region round Tula to Kieff and to Kharkoff, the centre of the Donets industrial region. This and the other southern lines carry large freights of wheat for export from the ports of Odessa, Nicolaieff, Kherson, and Taganrog. The most important industrial centres of Poland are Warsaw, on the Vistula, and Lodz, both growing rapidly. Great fairs are held annually in many towns, that of Nizhni-Novgorod being the most important.

The export trade of European Russia is in cereals—wheat, barley, rye, oats, and maize—shipped chiefly from the Black Sea ports; petroleum from Batum and Poti; flax, timber, linseed, eggs, and dairy produce principally from the Baltic ports of Libau, Riga, Reval, and St Petersburg. The imports are raw materials, wholly or partially manufactured goods

(including hardware and textiles), tea from China and in recent years from Ceylon, spirits, coffee, and other colonial produce. The largest trade is with Germany, and next with the United Kingdom, which takes cereals, timber, tow, flax, linseed, and eggs, and sends in return machinery and iron goods, coal, wool from Australia, woollens, and fish.

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## CHAPTER XVII.

### MEDITERRANEAN LANDS.

THERE is a similarity in the climate and productions of the lands bordering the Mediterranean Sea which makes them one great natural region. The southern boundary is formed by the arid Sahara, a far more formidable barrier than the mountainous regions of the Pyrenees, the Central Plateau of France, the Alps, the Balkans, and the Caucasus, whose southern slopes are its northern limit. The waters are deep, the coasts are broken, and the inland regions are mountainous, so that the configuration favours communication by sea, which has always played an important part in the history of the Mediterranean region. The eastern limit of the region is naturally the Syrian and Arabian deserts in the south, but as the climate and productions of Persia are very similar, the eastern boundary may be extended in the north to the Persian deserts.

The peninsula of Italy divides the sea into two basins, the Eastern and Western Mediterranean. The Eastern Mediterranean consists of the sea extending

from the Levant to the Gulf of Gabes. Two great extensions open to the north—the island-studded Ægean leading to the Black Sea, and the Ionian Sea leading to the Adriatic. Except for the irrigated Nile valley, the southern lands are almost desert. A number of narrow and short valleys are found round the coasts of Asia Minor and the south of the Balkan Peninsula, and small fertile basins exist at higher levels. Much of the land of these two peninsulas is rugged mountain-land. The only extensive alluvial plain opening into the Eastern Mediterranean basin is that of the Po, at the head of the Adriatic, which, except here and in Apulia, is bordered by mountains. The Western Mediterranean is bordered by the foreland of the Atlas Mountains, the valleys of Spain at the foot of the plateau (*meseta*), the coastal lands of southern France and the lower Rhone valley, the Riviera, the western slopes of the Apennines and the hilly lands that skirt them, and contains the islands of the Balearic group, Corsica, Sardinia, and Sicily. The Majerda, lower Rhone, and Ebro are fertile alluvial valleys opening to the Western Mediterranean. The plains of Andalusia and the lower Tagus may be considered with this region, although they are connected with the Atlantic.

The Dardanelles and Bosphorus, the Vardar-Morava valleys, the Alpine passes (especially the Brenner), the Rhone valley, the Carcassonne Gap between the Central Plateau of France and the Pyrenees, and the Strait of Gibraltar have been the chief passages from this region to the rest of Europe. The connection with Asia has been between the Levant and the Euphrates by the Nile and the Red Sea, or by more

difficult caravan routes across the Syrian tableland or Armenian plateau.

**Climate and Productions.**—The climate of Mediterranean lands resembles that which we have studied in Victoria, south-western Australia, and the Cape peninsula of South Africa. The summers are hot, but perfectly dry. Most rain falls in winter, or else in autumn or spring.

The dry summer is the resting-time for plants. It permits the ripening of fruits of all kinds, and allows them to be preserved by being dried in the sun.

The Mediterranean region, therefore, is a fruit-producing region, where the softer fruits can come to perfection.

The vine is the most important, and is grown for its fruits—(a) fresh grapes; (b) dried raisins or currants, especially in the eastern regions inhabited by Mohammedans, who are prohibited by their law from drinking wine; and (c) grape juice, which is fermented into wine in the western region.

Oranges and lemons, figs and olives, peaches and apricots, carobs (locust beans), pomegranates, and, in the oases of the African desert, dates are among the other fruits of this region.

The oak-tree is very important, one species yielding cork; another, indigenous to the Levant, acorn-cups, known as valonia, which is used by tanners. Maize is the most important cereal in this region; rice and cotton are grown in the irrigated lands of the Po and other rivers. The Walachian plain, which produces much wheat and maize, is rather to be considered with Russia than with Mediterranean countries. The Nile

forms a strip of fertile land through the desert, where cereals, cotton, and pulses are cultivated. Throughout the Mediterranean region, lucerne, a kind of clover, is a most important crop.

In the mountain regions sheep and goats are kept, the flocks being driven up to the hills in summer and down to the plains in winter. Mules and donkeys are more common than horses. Dairy produce is of little importance, except in northern Italy, where cheese is made. Oxen are used for draught purposes. Fowls are very numerous.

The minerals are not important except in the Balkan and Iberian Peninsulas, where the older rocks are rich in many metals, especially copper and iron.

Domestic industries are the most important over much of this area. Modern manufacturing processes are adopted in the larger cities, especially in the west. The valleys of the Po and Rhone are busy industrial regions.

The trade of the different countries has been described in Chapter IX. of the first part of the author's book in this series on the *Commercial Geography of the British Isles*, pp. 113-117.

## PERSIA.

Persia is a desert plateau, with a more fertile western and north-western margin, especially where irrigated, and dense forests on the northern slopes of the Elburz Mountains south of the Caspian. It may be described with the Mediterranean region, as most rain falls in winter, and the natural products are of Mediterranean type. Fruits and rice are the chief



vegetable, carpets and hides the most important manufactured, productions. The trade in the north is passing into Russian hands, from Meshed in the north-west to Ashabad on the Trans-Caspian Railway, and from Tehran or Teheran, the capital, to Resht on the Caspian. Tabriz is the north-western trade centre, and sends caravans to Trebizond on the Black Sea. Direct overland trade with India has been opened from Kerman across Baluchistan, but most still passes through Ispahan and Shiraz and the Persian Gulf ports, of which Bushire, Bundar Abbas, and Linga are the most important.

### EGYPT.

Egypt is a desert except on either side of the Nile where the waters cover the land in times of flood, or where it is irrigated by pumping the water from the river. The flood-waters deposit a fertile mud, which comes from the volcanic plateau of Abyssinia. By means of great dams at Assuan, Asyut, and at the head of the delta, the waters of the river are regulated and irrigation is assured at all seasons, permitting as many as three crops to be raised in a year. Rice, maize, wheat, cotton, lentils and other pulses are grown. The chief city is Cairo, at the head of the delta; the chief port Alexandria, at the west of the delta. By railway and steamer the desert is crossed to the south. The narrow isthmus of Suez is traversed by a canal about 100 miles long and 26 feet deep, between Suez on the Red Sea and Port Said on the Mediterranean, through which the greater number of steamers between Europe and India, Australia, and the Far East pass.

Egypt is controlled by Britain, although nominally Turkish.

### THE OTTOMAN OR TURKISH EMPIRE.

This great empire includes the desert regions of Tripoli and Barka and Arabia, with their few date-producing oases; the alluvial plains of Mesopotamia, at present unproductive, but which will become as rich as Egypt when properly irrigated; Syria and Asia Minor, with fertile coasts and drier and more barren hinderlands; Thrace, Macedonia, and Albania, in Europe, hilly regions with fertile plains growing Mediterranean produce; as well as feudatory states, such as Egypt, Cyprus, Crete, Bulgaria, Bosnia-Herzegovina, which are not actually controlled by the Ottoman Turks.

The Arabian region is noted for its coffee and gums; the Levant for its raisins and other fruits, silk, wool, and valonia; and European Turkey for its attar of roses.

Commercially the Ottoman Empire is not so important as the much smaller state of Switzerland. The products exported are grapes (mainly as raisins), silk, cereals, opium, wool and hair, valonia, and coffee, the chief manufactured article being carpets. Linen, sugar, quilting, cotton-yarn, coffee, petroleum, flour, and rice are the most valuable imports.

Jaffa, Acre, and Beirut are the chief ports in southern Syria, and are connected by railway, the first with Jerusalem, the second and third with Damascus. Alexandretta, the northern port of the Levant, has a trade passing eastward through

Aleppo. Smyrna is by far the most important seaport in Asia Minor. The position of Constantinople on the crescent-shaped inlet of the Bosphorus known as the Golden Horn ensures it a great entrepôt trade. It lies where the mainland route from southern Europe crosses to Asia Minor, and by it all vessels trading between the Black Sea and the Mediterranean or more distant ports must pass. Saloniki, or Salonica, is another terminus of the route from central Europe to the East *viâ* the Vardar valley. Adrianople is in the centre of the rose-gardens from whose blooms the attar of roses is distilled.

### GREECE.

Greece is a barren, mountainous land with a number of small fertile plains. Cereals are the chief crops, but the principal exports are currants and the fine manganese iron ore and hematite from the Laurium region. Wines, tobacco, valonia, olive-oil, and figs are minor exports. Cereals, textiles, timber, coal, and food products are the most important imports.

Piræus, the port of Athens, and Patras, on the Gulf of Patras, are the chief ports for currants and valonia. They are connected by a railway, which is continued along the west coast. A branch from Corinth runs across the Morea to Kalamata. Volo is the port of Thessaly. Syra, or Hermupolis, is the coaling-station and commercial centre of the Archipelago, and exports emery and iron ore. Since a ship-canal was cut across the isthmus of Corinth, the voyage between the Ægean and Ionian Seas has been considerably shortened.

## ITALY.

The Apennines divide Italy into three lowland regions—the Paduan (Lombard-Venetian) Plain, the Western Foreland between Tuscany and Campania, and the Eastern Apulian Foreland—to which must be added the islands of Sicily and Sardinia.

The north is economically by far the most important part of Italy. Cattle feed on the meadows of the surrounding mountains, and on the rich, moist, low-lying lands near the Po, and silkworms on the mulberries of the forests, whose trees yield timber. Olive-groves and vineyards exist on the southern slopes of the Alps turned to the sun, but not on the northern slopes of the Apennines. The alluvial lands are irrigated by a great canal system, which the melting Alpine snows keep well supplied with water even in the driest summer, permitting two, three, or even more crops to be gathered every year. Rice can be grown, and maize (for polenta), pulses, flax, and other plants used for food or in industry. The irrigated meadowlands can be cut four or five times a year, and supply food to the cows, whose milk is made into Gorgonzola and other cheeses.

The **peninsular hilly lands** are terraced and cultivated, especially in western Italy round the Arno and in the Alban Hills. Olive-groves abound, and olive-oil is manufactured, that of Lucca being noted. Here the flocks and herds are driven to the upper grass-lands of the Apennines in summer and to the plains in winter. The goats and their keepers have destroyed much of the old forested land, and caused great deterioration in the productivity of the hilly land.

In **Sicily** the irrigated lands are of exceptional fertility, yielding crops at all times. Excellent crops of wheat, maize, and rice are raised, and olive, orange, lemon, and fig groves and vineyards are found on the terraced lands. Even cotton is grown.

The resources of **Sardinia** have not been greatly developed, but cereals, wine, oil, and cheese are produced and exported, and the south-west has a store of minerals.

Italy has few **minerals** except the salt of its lagoons, the sulphur of the volcanic regions, the white marble of Carrara, and the iron ores of Elba and Sardinia. Silver, lead, and zinc are also found in Sardinia. Coal is almost absent, but some brown coal is mined in Tuscany.

**Manufactures.**—The water-power of the Alpine rivers is utilised, especially for generating electricity, which is perhaps more used in northern Italy than elsewhere. Silk-spinning is carried on in all the villages and towns at the mouths of the Alpine valleys, and great silk-factories have been built at Bergamo, Brescia, Como, and Milan. Cotton, wool, and jute are also manufactured in the northern towns. Milan and Turin (Milano and Torino) are important engineering centres, and Brescia is famous for its knives and arms. Straw-plaiting is the characteristic industry of Tuscany. Venice (Venezia) is noted for the manufacture of lace and glass, Padua (Padova) for stringed musical instruments, and most of the large towns, especially Florence, Rome, and Naples (Firenze, Roma, and Napoli), for mosaics, sculptured figures, furniture, coral and other jewellery, and *objets d'art*.

The routes from Italy to the north run on the

east and west sides of the peninsula. A great line crosses the Apennines from Florence to Bologna, where it meets that running parallel to the old Æmilian Way from Ancona to Piacenza. From Turin the Mont Cenis, from Milan the St Gotthard, from Verona the Brenner lines cross the Alps; and the eastern routes diverge from Venice by Udine and Pontafel to Klagenfurt and Vienna, and by Görz to Trieste, Laibach, and the Save.

Venice (Venezia) is the eastern and Genoa (Genova) the western port of the northern region, Leghorn (Livorno) of Tuscany, Naples of the Campagna, Palermo and Messina of Sicily, and Cagliari of Sardinia. Brindisi and Naples are ports used by vessels for the Far East, and Genoa for trans-Atlantic liners.

Since the opening of the Alpine tunnels the overland trade with northern Europe, especially with Germany, has developed, partly at the expense of the sea-borne trade with the United Kingdom. The exports are silk and silk goods, wine, olive-oil, fruit, straw ware, and sulphur; the imports, coal, raw cotton, silk and wool, machinery, wheat, and timber. Most trade is done with the German Empire, the United Kingdom, France, Austria, Switzerland, and the United States.

## SPAIN AND PORTUGAL

The bulk of the Iberian Peninsula is a plateau, separated from the Pyrenees by the plains of the Ebro, and from the Sierra Nevada by the plains of the Guadalquivir or Andalusia. These two plains and the smaller ones on the west and Mediterranean coasts

are carefully irrigated and cultivated, while the hills around them are elaborately terraced. On these **terraced hillsides** and coastal plains oranges, lemons, grapes, figs, olives, and other fruits are grown. Maize, wheat, and tobacco also flourish on the alluvial plains. Great groves of cork-oak are found in the extreme south of Portugal and of Spain. The north-western and northern **mountains** receive abundant rain at most seasons, and climatically belong to central Europe. They yield timber. The climate of the **plateau** is one of extreme temperatures and great dryness, which prevents cultivation without irrigation. In Old Castile, which is crossed by numerous rivers from the rainy regions of the extreme north, great irrigation-works have been carried out, and the region is noted for its excellent wheat. Elsewhere on the plateau the tending of merino sheep and goats is the most important occupation. Sardine and tunny **fisheries** are carried on round the coast.

Spain is rich in **minerals**. Iron, coal (in Asturias), manganese, and other metals occur in the Cantabrian Mountains of the north; copper, silver-lead, mercury, iron and other ores, and coal are mined in the Sierra Morena in the south. The crude or half-refined ores are exported to Britain, Germany, Belgium, and other countries to be refined.

The recent loss of its colonies has temporarily checked Spanish **industries**. The chief centre is Barcelona, noted for its manufactures of silk and cotton. Cloth is made at Palencia, pottery at the royal works at La Granja north of Madrid, and tobacco is manufactured at Seville.

The **railway lines** radiate from Madrid, in the centre,

but, with few exceptions, the important towns are on the coast. Barcelona is the chief Mediterranean port, and acts as the outlet for the Ebro valley. Valencia, Malaga, on the Mediterranean, and Cadiz, on the Atlantic, are important fruit and wine ports. Seville can be reached by steamers. In the north, Gijon is the outport of the Asturias coalfield, and Santander and Bilbao of the iron-mines in the Cantabrian Mountains.

The chief **exports of Spain** are the products of its vineyards, orchards, and mines, live-stock, and food substances. Cotton, raw and manufactured, machinery and other manufactured iron goods, and chemicals are the most important imports.

The chief **exports of Portugal** are wine from Oporto, sardines, cork, fruits, olive-oil, and copper ore from the south through Lisbon, from which cottons are exported to Portuguese colonies. Cereals, cotton and other textiles, coal, cod-fish, sugar, and other colonial products are the chief imports. Lisbon, on the estuary of the Tagus, is an important port for vessels plying between South America and Europe.

### THE BARBARY STATES.

**Tunis**, a French protectorate, and **Algeria**, which forms part of France, are at present the most important of the Barbary States. They consist of a coastal range, behind which stretches the fertile Tell, drained in the east by the Majerda, and in the west by the Shelif. Here vines and olives, cereals, including wheat, maize, and to a smaller extent tobacco, colza and other oil-seeds, are grown. On the high



plateaus between the Mediterranean Atlas and the Saharan Atlas the alfa or esparto grass is the chief economic product. Goats and sheep are the most important animals of the plateau, cattle and horses of the Tell, and camels in the desert, where the oases, natural or formed round artesian wells, support date-palms under whose shade maize, millet, root-crops, and fruits mature. Iron, copper, lead, and zinc are found.

The chief railway route traverses the Tell from Tunis by Constantine and Algiers to Oran. Long lines branch from it southwards to the desert, in the east to Biskra, in the west to beyond Aïn Sefra, and shorter ones northward to the ports of Bône, Philippeville, and Bougie. It has been proposed to extend one of the southern lines across the desert to the Sudan.

**Marocco** is an independent sultanate in the west, consisting of a coastal plain, bordered by an undulating country, which gives place in the south-east to the lofty mountains of the Great Atlas. The north-western slopes of the Atlas and the land at their base are well watered and very fertile. All Mediterranean produce might be cultivated, but the resources of the country are little developed. The valley of the Wadi Draa and other intermittent rivers lies between the Great and Little Atlas, the latter a lofty plateau of the desert which extends to the eastern slopes of the Great Atlas. Tafilet and other oases are noted for dates.

The chief exports are wool and hides, dates and almonds, gums and eggs. The caravan routes diverge from Marakesh or Marocco city in the south, whose port is Mogador, or Fez in the north, where the chief port is Tangiers.

## CHAPTER XVIII.

## FRANCE.

**Position and Configuration.**—France lies in the centre of the land hemisphere, between  $43^{\circ}$  and  $51^{\circ}$  N. lat. On three of its sides it is bordered by water—the Mediterranean in the south-east, the Atlantic in the west, and the English Channel on the north-west. On the south-west it is separated from Spain by the Pyrenees; on the east from Italy and Switzerland by the Alps and the Jura; and on the north-east from Germany, Luxemburg, and Belgium by the Vosges and the Ardennes. A great Central Plateau rises in the southern half of the country, separated from the Alps by the valley of the Rhone, and from the Pyrenees by the valley of the Garonne, and drained by the Garonne and the Loire and their tributaries. From this plateau north-eastward to the Vosges runs a line of higher ground, the plateau of Langres, from which flow the Seine and its chief tributaries. The north of France is a plain, with low hills rising above it, especially in Normandy and Brittany.

**Climate.**—The climate of the north of France resembles that of the south of England. The winters are not very cold; the summers are not excessively hot. Rain falls all the year round, but most abundantly in autumn and winter, and more heavily near the coast than farther inland. South of the Loire there is a marked dry summer, which is of great importance for ripening the vine. In the south the climate is of the Mediterranean type—almost rainless

in June, July, and August, and with most rain in spring and autumn.

**Products.**—Forests occur on the slopes of the mountains, on the edge of the Central Plateau, and in scattered groups, sometimes of considerable size, on the plains. Great pine-woods have been planted on the sandy Landes, south of the Gironde; oak and beech are characteristic of the northern plains, pine-woods of the mountain forests, the chestnut of the Cevennes, the walnut of Poitou, and cork-oak and olive-groves of the Mediterranean region.

The pasture-lands of France consist of mountain meadows in the Pyrenees, on the Central Plateau, and in the Alps, and of grassy plains and hills in the north. Horses, cattle, and pigs are reared in Brittany and Normandy. Cattle are kept on the upper meadows and on the wetter lower slopes of the mountains, but are replaced on the higher regions facing the Mediterranean by sheep, which are grazed on the mountains in summer and on the deltaic plains of the Rhone in winter.

The north of France is famous for its apple-orchards and for its cider. Industrial plants, especially sugar-beet and flax, are cultivated in the north-east. The upper Allier and Saône and the middle Seine basins and the extreme north-east of France produce excellent wheat. The lower lands of Aquitaine produce some wheat, and maize and tobacco are also grown. Almost everywhere in France, except in the north, the vine is important, and is made into wine south of a line from the mouth of the Loire to the Ardennes. The vineyards of Medoc, west of the Gironde estuary, produce the

wines known as Bordeaux or clarets. The south is in a pre-eminent degree the land of the vine and olive. The vineyards of Languedoc are the most productive in France; but the vine is grown throughout the Rhone-Saône valley and as far north as Burgundy and Champagne, where the wines known by these names are produced. The olive-oil of Provence is remarkable for its delicate flavour. Oranges, figs, and other Mediterranean fruits are also grown in the south, and the mulberry is cultivated as food for silkworms.

**Minerals and Manufactures.**—France is rich in iron, which is found round the Central Plateau and in the north-east. Coal, however, is relatively scarce. The Valenciennes field, round Lille, is the most important. Round the Central Plateau are grouped the small fields of Blanzey, St Étienne, Alais, Carmaux, and Comentry, which support a variety of industries. Iron, steel, and machinery are made at Le Creusot near the Blanzey coalfield, cannon and other firearms at St Étienne, steel on the Alais and Carmaux fields, porcelain and glass round Limoges, woollen and textiles in Languedoc, and silk at Lyon and St Étienne. On the Valenciennes field, Lille manufactures machinery and chemicals. Valenciennes, Cambrai, and towns in Normandy and Maine are noted for fine linens and lace. Woollen goods are made at Roubaix, Tourcoing, and other towns, and south of the Ardennes at Reims and at Elbeuf on the Seine. On the western slopes of the Vosges are a number of small towns engaged in manufacturing cotton, but the chief centre of this industry is Rouen and the surrounding district of the lower Seine,

where the raw material is easily obtained from America, Brazil, and elsewhere.

Shipbuilding is important at Marseilles, Rochefort, Nantes, Le Havre. The great naval shipyard is at Toulon. Round Bordeaux and Nantes cane-sugar is refined, and at Marseilles soap is made from raw materials discharged at the wharves of these ports. Paris is the centre for the manufacture of *objets d'art*, clothing, &c., and near it are the famous porcelain-works of Sèvres.

**Internal Communication and Trade Centres.**—Water-traffic is exceedingly important, and great attention is paid to the canalisation of rivers and the construction of canals. The heaviest water-traffic is between Paris and the northern industrial region by the Oise, from which canals run to the Somme, Sambre, Schelde, Lys, and other northern rivers, as well as to Dunkirk, on the North Sea. The Aisne is connected by canal with the Marne, from which canals communicate with the upper Saône and with the Rhine at Strassburg. The Seine is canalised from the Yonne to its mouth, and connected by canals with the Loire and the Saône, the latter continuing the traffic down the Rhone to the Mediterranean and up the Doubs to the Rhine. The Canal du Midi joins the Mediterranean to the Garonne.

A network of railways covers the country, converging from all parts upon Paris. The Western line opens up Normandy and Brittany, and is connected with the chief northern ports, Brest, Cherbourg, Le Havre—the most important—and Dieppe. The Northern line connects the capital with the northern industrial and the northern countries of Europe, and

through Calais and Boulogne carries a large proportion of the Channel passenger traffic. The Eastern line passes to the upper Meuse and Moselle, the route by Nancy forming part of the Oriental Express route to Constantinople, that through the Burgundian Gate leading to Switzerland. The great Paris-Lyon-Mediterranean line passes by the Yonne to the Saône-Rhone valley, connecting with the Swiss lines through Dijon and Pontarlier, and with the Italian lines by Macon and the Mont Cenis tunnel or by Marseilles and the Riviera. This line carries more traffic than any other in the country. The Orléans line, the only other important line with a Paris terminus, sends branches from Orléans to St Nazaire by Nantes, to Bordeaux by Poitiers, and to Toulouse by Limoges. The poorer parts of the west are served by the State line. Bordeaux, Toulon, and Cette are connected by the South line (Midi), which runs to the Spanish frontier both east and west of the Pyrenees.

**Ports.**—Marseilles (Marseille), the most important as well as the most ancient port in France, is situated on a magnificent harbour to the east of the Rhone delta, and not on the delta itself, owing to the shallowness and variability of the distributaries. It is, however, the outlet for the produce of the Rhone valley, and the great storehouse into which are brought raw silk from the East to be manufactured at Lyon, raw cotton from Egypt and India, wool from Australia, palm-oil seeds from West Africa, linseed and other oils from India, copra from the South Seas, wheat from the Black Sea, and sheep and wines from Algeria. Cette is the wine-port of fertile Languedoc.

Bordeaux, at the head of the Gironde estuary, is the

outlet for the wine of the district, and the chief centre of the trade with South America, where finer manufactured articles of French, and particularly Parisian, origin are in great demand. Wool and hides from the Plate basin, oil from West Africa, and iron and lead from Spain are the chief cargoes brought into its wharves.

Nantes, at the mouth of the Loire, has a large trade with the West Indies and Central America, importing sugar in large quantities, and timber and coffee from Brazil. Its chief export is preserved fruit of various kinds.

Le Havre, at the mouth of the Seine, is the outlet for the cottons manufactured in the lower Seine. Raw cotton, wheat, and tobacco are brought from the United States, and coffee from Brazil. Le Havre and Cherbourg are the passenger ports for the United States. St Malo, Cherbourg, Dieppe, Boulogne, and Calais are important packet-stations for England, to which dairy produce and other goods are exported. All these are fishing-stations.

Boulogne and Dunkirk (Dunquerque or Dunkerque) are great fishing-ports, the former sending vessels to the Irish and Newfoundland fishing-grounds, the latter to the North Sea fisheries. Dunkirk exports the produce of the northern industrial region, and imports wool from the Plate, jute from India, iron from Spain, and timber from Canada and Scandinavia.

**Trade.**—The foreign import trade by land is chiefly in coal, iron, and zinc along the north-east frontier; cattle from Austria; cheese, clocks, and watches from Switzerland; and cattle, raw silk, and ice from northern Italy through the Mont Cenis tunnel.

In food-stuffs France is more self-supporting than Britain or Germany, and consequently imports little. The chief imports are raw materials, wool, silk and cotton, coal and timber, hides and oil-seeds; while the manufactured articles form a smaller proportion of the imports than in either the United Kingdom or Germany. On the other hand, France exports little raw material, mainly silk and wool, which in the manufactured state form the most important exports.

Wine, small-wares, cotton, leather and leather goods, and linens are next in importance, followed by elaborated products of the farms, cheese and butter, skins and furs, and chemical produce. The United Kingdom sends coal, woollen goods, machinery, cotton goods, and chemicals, and takes from France silk and woollen goods, wine, sugar, butter, leather, lace, brandy, and eggs.

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## CHAPTER XIX.

### ALPINE AND DANUBIAN LANDS.

#### SWITZERLAND.

SWITZERLAND consists of the central ranges of the Alps, the great valleys running between and from them, the plateau to the north, and part of the Jura Mountains, which form the western limit of the plateau. The climate and products of the plateau resemble those of southern Germany; those of the Rhone and Ticino valleys resemble those of northern Italy.

Switzerland, in ordinary parlance, means the high Alpine region, the beautiful scenery of which annually



attracts thousands of tourists to the country, rendering hotel-keeping an important and profitable occupation during the summer. £3,500,000 are said to be taken annually in Swiss hotels. The Alpine pastures support large numbers of cattle and goats, which are driven to the valleys in winter. These pastures are too remote from a market for the milk to be sold in a fresh state, and the surplus is either made into cheese or condensed and canned. The Switzerland of commerce, however, lies on the plateau, and along the great lakes and rivers which flow out of them, more particularly the Rhine, Reuss, Aar, and Rhone. The vine is cultivated on the lower southern slopes to the west of the plateau and in the Rhone and Ticino valleys. Cereals, potatoes, and fodder plants are grown on the plateau. Bee-keeping is important, and the silkworm is reared in the Ticino valley and the Grisons.

Switzerland is poor in minerals, but iron has recently been found near Meiringen in the upper Aar valley, and exists in the Jura. Water-power is abundantly supplied by innumerable waterfalls and rapids, fed by the Alpine snows, which can either be used directly for turning machinery or transformed into electric power. All the newer mountain railways are electric, and electric lighting is universal.

The industrial activity of Switzerland is very great, and supports two-fifths of the inhabitants. Machinery of all kinds is made at Zürich and Winterthur. Cotton is manufactured at St Gallen (St Gall) and Zürich, silk at Zürich and Basel. Clocks and watches are made at Geneva, and at Le Locle and Chaud de Fonds in the Jura.

**Routes.**—Switzerland is crossed by a number of

important trade-routes. Those from the west enter at Geneva or Basel at the south and north ends of the Jura, or else cross these mountains to Lausanne and Neuchâtel. Geneva and Basel are joined by a line at the eastern base of the Jura, which passes through Neuchâtel, and by another which runs by Lausanne and Bern. From Basel or Bern the line to the east passes by Zürich through the Vorarlberg tunnel; that to the south by Luzern, the St Gotthard tunnel, and the Ticino valley by Lugano to Milan; and a third route will be opened by the Rhone valley to northern Italy when the Simplon tunnel is completed.

**Trade.**—The chief trade is with Germany, France, Britain, and Italy; and the imports, many of which are re-exported, are worth nearly one and a half times the exports. Notwithstanding the disadvantage of its internal situation, Switzerland does a large trade with the United Kingdom, of which 75 per cent. consists of exports. A considerable trade is also carried on with America. Most of the food of the country is imported, as are also the raw materials of its manufactures, raw silk, cotton and wool, coal, and useful metals and minerals of all kinds. Manufactured goods, especially silks and cottons, watches and clocks, machinery, and elaborated food products are the chief exports.

### AUSTRIA-HUNGARY.

Austria-Hungary consists of two great states, differing widely both in physical and ethnic characters. The Austrian Empire is made up of the Bohemian and

Moravian plateau, north of the Danube; Galicia and Bukovina, on the northern foreland of the Karpathians; the various provinces of the eastern Alps, south of it; Austria Proper, occupying the valley of the Danube between the Inn and the Leitha; and the coast-lands of Istria and Dalmatia on the Adriatic. Hungary consists of the plain of Hungary, surrounded by the Karpathians, and Kroatia, by which access is had to the Adriatic. The mountainous region of Bosnia-Herzegovina, which is part of the Balkan Peninsula, while nominally still Turkish territory, is administered by Austria.

### AUSTRIA.

**Bohemia, Silesia, and Moravia.**—Bohemia is a plateau, bordered by the mountains of the Bohemian Forest (Böhmerwald), the Ore Mountains (Erzgebirge), and the Sudetes Mountains. It is drained to the north by the Moldau, the chief tributary of the Elbe, which rises in the Sudetes Mountains. The climate is extreme, with cold winters and hot summers. The rainfall is small except in the mountains, and is heaviest in summer. One-third of the surface is forested, and more than one-half is under cultivation. Wheat, oats, rye, barley, flax, hops, and sugar-beet are the principal crops. Minerals are abundant in the mountains, including silver, lead, copper, tin, and iron. Coal is widely distributed, and extensively worked in the north.

Industrially, Bohemia is one of the most active regions of Europe. Sugar, beer, and brandy are manufactured, Pilsener beer having a world-wide reputation. Paper, porcelain, glass of fine quality, iron and steel

goods of all kinds, woollens, linens, and other textiles are also made, and dyeing and calico-printing are carried to great perfection. Prag (Prague), the capital, on the Moldau, is the most important manufacturing town, and the centre of routes which radiate in all directions. Reichenberg, in the north, is the centre of the woollen manufacture. Brünn, the capital of Moravia, manufactures machinery and woollens, and is engaged in dyeing.

**Galicia and Bukovina** occupy the northern slopes and foreland of the Karpathians. The climate is drier and more extreme than that of Bohemia. The Karpathian area is forested. The crops cultivated are rye, barley, wheat, and oats. Sheep are the chief livestock. Zinc and coal are found near the confluence of the San and the Vistula. Wieliczka, near Krakow, has long been famous for its salt-mines, which form a great underground town of many streets. Sugar and paper are the only important manufactures. Czernovitz, in Bukovina, is the centre of the latter.

**The Eastern Alpine Provinces and Austria Proper.**—The Alpine and Danubian provinces of the Austrian Empire consist of the valley of the Danube, between the Inn and the Leitha, the eastern Alps drained to the Danube, with the exception of the Engadine, and the valley of the Etsch (Adige) opening out to northern Italy. Wheat, rye, and other cereals are cultivated in the lower valleys of the Danube. In the Alps mountain pastures and forests replace agricultural land, except in the valleys. Those opening to the south and east are planted with the vine and mulberry. The agriculture of the Etsch valley approximates to that of northern Italy.

Minerals are abundant in the eastern portion of the eastern Alps. Iron is found in Eisenerz in Carinthia, lead at Bleiberg, mercury at Idria, and some lignite near Graz.

Manufactures of very varied kinds are carried on in and around Vienna, including shipbuilding for the Danube trade. Silk is manufactured in the south of Tirol and in Vorarlberg.

**The Dalmatian Coastal Region** is mountainous, and fringed by islands. Cereals are cultivated, as well as the vine and olive. About one-third of the surface is forested, and nearly one-half is pasture. Cattle-raising and fishing are important occupations.

Trieste, the seaport of Austria, lies on the Adriatic, at the north of the Istrian peninsula.

**Bosnia-Herzegovina** is a forested, mountainous land, with deep fertile valleys. It is noted for its oak-trees and plums. Cattle are reared. Coal and salt are mined.

## HUNGARY.

Hungary lies between 45° and 51° N., and is about equal to the British Isles in area. It is a vast grassy plain, surrounded by forest-clad mountains. In climate and products it somewhat resembles southern Manchuria in the same latitudes. It is crossed by the Danube and its tributaries, the Tisza (Theiss), with its whole course in Hungary and receiving the Maros from the Transylvanian Alps, and the Drave and Save, which border Kroatia and Slavonia. It consists of two plains, separated by the Bakony Forest and surrounded by the North Hungarian Ore Mountain in the north, the Karpethians in the north-east, the

mountainous Transylvania in the south-east (Bihar Mountains and Transylvanian Alps), and the Highlands of Kroatia and Slavonia in the south-west.

The forests yield excellent timber. The grassy plains, or *pusztas*, support vast numbers of horses, cattle, and pigs. Many parts have been brought under cultivation, yielding rich crops of wheat, maize, barley, and rye.

The mineral wealth of Hungary is very great. Gold and mercury are found in the Transylvanian Alps. The Karpathians are rich in iron, silver, and lead.

Economically, Hungary is in a state of transition. Until recently it was a pastoral, lumbering, mining, and agricultural country, but at the present time manufactures are developing at a very rapid rate. Budapest mills flour, manufactures jute for flour-sacks, and also makes machinery, spirits, and transport material. At Pressburg, where very similar manufactures are carried on, there is a great dynamite factory. Agram (Zagrab), the capital of Kroatia, manufactures tobacco and leather. From Fiume, the port of Hungary on the Adriatic, flour is exported, the bulk of the unmilled grain, however, as well as large quantities of flour, being exported down the Danube. The dry air of Hungary is favourable to the manufacture of excellent flour, much better than can be obtained from Hungarian wheat ground in Britain.

**Trade and Routes of Austria-Hungary.**—The staple exports of Austria-Hungary are timber from the mountains, wheat and flour from the plain of Hungary, sugar and manufactured goods, among which the glass of Bohemia is especially famous, eggs, cattle, and

horses. The imports are cotton goods, coal, tobacco, coffee, wool, wine, and manufactured articles.

The chief trade is with Germany, the United Kingdom, Italy, Russia, Switzerland, Romania, France, and the Balkan States.

The Danube is the great commercial artery of the country, across which it flows from north-west to south-east. It is navigable throughout its course within the empire, from which it issues through a narrow gorge or klissura, at the end of which a canal has been constructed to avoid the shallow rapids at the Iron Gates, where Orsova is built.

Vienna and Budapest are the chief centres of communication, and the Oriental Express route passes through both, following the valley of the Danube to Belgrad. From Vienna lines run north to Berlin through Prag, north-east into Russia by Krakow, and south-west by the Semmering Pass to the longitudinal valleys of the eastern Alps and the Adriatic. At Innsbruck the Brenner Pass route to Italy diverges down the Etsch (Adige) valley, and the Vorarlberg route runs westward to Switzerland. From Budapest lines pass across the Karpathians to Russia, across the Transylvanian Alps to Romania, and to the Adriatic at Fiume.

### SERVIA.

Servia is a mountainous land south of the Save and Danube, drained by the Morava. It abounds in oak and beech forests, in which feed vast herds of swine. Maize is grown for food, wheat for export, while vines are cultivated in the north-east. Plum-orchards are found in all parts, whose fruit forms prunes when

dried, and brandy (*slivovitsa*) when fermented and distilled. The mineral wealth is great, but little use is made of it at present through lack of good roads and capital. Belgrade, on the Danube, at the mouth of the Save, is the capital and chief town, from which the railway follows the Morava to Nish, where it branches to Sofia and Constantinople in the east and to Salonica in the south. Domestic manufactures are still by far the most important.

### BULGARIA.

Bulgaria lies to the east of Servia, and includes the Balkan Mountains, a limestone foreland to the north, and the Tunja and upper Maritsa valleys (Eastern Rumelia) to the south. The deeply incised valleys of the Balkan foreland are fertile strips across a bare plateau, which ends in a more fruitful belt of loess near the Danube. Wheat, maize, and barley are the chief crops. In the southern valleys there are many fragrant rose-gardens, whose flowers are used to make the famous attar of roses. Vineyards are numerous, tobacco cultivation is of some consequence, and plum-orchards are common in the north. Silkworms are reared. The mountains are forested, oak and beech predominating. Sheep, goats, and cattle are the most important live-stock.

The industrial development of Bulgaria is beginning. Coal (at Pernik) and iron are the chief minerals worked. Modern factories exist in Sofia, the capital. The river-ports are Vidin, Rushchuk, and Silistria. Varna to the north and Burgas to the south of the Balkans are the Black Sea ports, and both are joined



to **Sofia** by railways, one to the north, the other to the south, of the Balkans.

### ROMANIA, OR RUMANIA.

Romania lies between the Transylvanian Alps and the Danube, between the Eastern Carpathians and the Pruth, and includes the delta of the Danube and the Dobruja to the south. It is a well-forested mountain land, sinking to a fertile loess-covered foreland, across which the rivers cut their way in deep valleys. One-fifth of the land is forested and two-fifths cultivated. Wheat and maize are by far the most important crops, but barley and other cereals, grapes and plums, beet-root, colza, and flax are also grown. Live-stock are numerous, and, as in Serbia, pigs are exceptionally abundant. Petroleum (at Ploesci), salt (at Craiova), coal, and iron are the chief minerals. Paper, sugar, tobacco, and other factories are being built. The industrial expansion which characterised the lower Danubian states in the last decade of the nineteenth century was greatest in Romania.

The chief trade is with Austria-Hungary, the German Empire, and the United Kingdom; after which come Turkey, France, Italy, and Belgium. Cereals are by far the most valuable export, fruits, wood, and mineral fuel coming next. Manufactured goods of all kinds, colonial produce, and chemicals are the chief imports.

Bukarest (or Bucuresci), the capital, close to the border of the Walachian and Moldavian plains, is the commercial and industrial centre, from which railways radiate. Lines cross the mountains to Hungary, the Danube to Constantza (Kustenje), a port

on the Black Sea, and through Moldavia, of which Yassy (Iasi) is the chief town, collecting agricultural produce. The cereals are brought to Braila and Galats on the Danube for exportation, through the Sulina distributary of the Danube, which is that most used by steamers.

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## CHAPTER XX.

### THE GERMAN EMPIRE.

THE German Empire, popularly but incorrectly called Germany, lies between the northern slopes of the Alps on the south and the Baltic Sea on the north, and between the mouth of the Ems on the west and the Niemen on the east. Lying between  $47\frac{1}{2}^{\circ}$  and  $55^{\circ}$  N., it is farther from the equator than any part of the southern hemisphere considered except Patagonia, and corresponds in latitude with Newfoundland in the northern hemisphere.

**Configuration.**—Physically, Germany consists of two very different regions, the Southern Highlands and the Northern Plains.

The Southern Highlands are formed of rounded hills covered with thick forests, except on the highest summits, and well-developed valleys, whose lower slopes and bottoms are cultivated. The upper Danube and its tributaries flow across a plateau to the south of which rise the Alps, and to the north the German Juras. The middle Rhine passes down a very fertile plain, twenty to twenty-five miles wide, between the Black Forest (Schwarzwald) and the Vosges, before it enters a gorge in the Lower Rhine Highlands. The

Neckar and Main, its chief tributaries on the right bank, drain the escarpments and gently sloping regions of the German Juras. Another lower fertile region lies between the hills of Thuringia and the Harz. These hills are drained to the Weser in the west, and to the Saale and Elbe in the east.

The Rhine, shortly after reaching the lowlands, makes a great delta, which forms part of Holland and Belgium. To the east of the delta a belt of lowland extends to Russia and permits easy communication, which is interrupted here and there by marshes. It is bounded on the north by a band of higher ground, rugged, covered with pine-woods, and dotted with lakes and lakelets, due to morainic accumulations, and known as the Baltic Heights. The estuaries of the Weser and Elbe form convenient openings from this lowland to the North Sea. The Oder, a German river, and the Vistula and Niemen, whose lower courses are within the Empire, flow to the Baltic between morainic heights. They all enter lagoons (*Haffen*), separated from the sea by sandspits.

The Baltic Sea, the Central Lowlands, the Main, and the Danube valleys all facilitate communication between east and west. The other rivers permit ready transport between north and south across the lowlands, but only the Rhine acts as a route uniting the north and the margin of the Alps.

**Climate.**—The German Empire extends as far north as England, and as far south as the Loire in France. It is, however, farther removed from the influence of the ocean, and has therefore hotter summers, colder winters, and less rain than the corresponding regions of England and France. The range of temperature

increases and the rainfall diminishes from west to east and from north to south. The mean annual temperature varies little from north to south, as the gradual rise of the land from the Baltic to the Alps compensates for the lower latitude. The climatic conditions are comparatively uniform, the main divisions being the colder, drier east; the milder, wetter west; and the south-west, with its very dry autumns.

**Plants and Animals.**—Less than one-tenth of Germany is unproductive, one-quarter is covered with forests, one-sixth with meadows, and nearly one-half consists of arable land. Three-quarters of the forests are pine-woods, which clothe the upper slopes of the Southern Highlands, and are also found in parts of the Northern Lowlands; the remainder is composed of mixed woods, wherein beech predominates, on the lower slopes of the hills. The forests of Germany are regarded as a valuable national asset, and they are under highly-skilled supervision.

The eastern half of the plain, especially Prussia, and the Bavarian plateau are noted for horses. Sheep are kept on the undulating heights south of the Baltic. In Saxony and Silesia sheep are relatively few in number, but their wool is famous for its quality. Cattle are most numerous in the meadows of the highlands and the western plains. The eastern plains support pigs and poultry of all kinds, geese being a specialty of Pomerania. The lowlands south of the Baltic Heights, the lower part of the Danube plateau, and the Rhine plains are the most important agricultural regions. Of cereals, rye is the most extensively cultivated, and is still the staple cereal food in many parts of Germany, especially in the east. Except

in the extreme north-west, more than 10 per cent. of the lowlands are cultivated with rye. Wheat is chiefly grown in the valleys, and oats on the hillsides of the highlands. Some buckwheat is grown in the sandy soils of the north, and some maize in the extreme south. The sugar-beet is extensively grown on the plains. Flax is cultivated in the east of the Baltic Heights, and to a smaller extent in upper Silesia. Hops are grown on the Bavarian plateau and in the upper Rhine district. The vine is widely cultivated, but does best on the hilly slopes above the Rhine and its chief tributaries, which face the sun.

Both the North and Baltic Seas are well stocked with edible fish. Herring-fishing and cod-fishing are important occupations. Fresh-water fish are numerous in the rivers and lakes.

**Minerals.**—Germany is very rich in minerals, more particularly in coal and iron. The chief coalfields are in Silesia, Saxony, the Ruhr valley of Westphalia, and the valley of the Saar. The Harz Mountains produce silver, lead, and copper, and much iron is mined in Lorraine. The Ore Mountains (Erzgebirge) yield tin. Silesia and west Prussia are noted for zinc. Salt is mined at Stassfurt and Halle, in Prussia, and in Saxony. Many varieties of excellent building-stone are found, as well as clay suitable for bricks, pottery, and porcelain.

**Manufactures.**—More people are now engaged in manufacture than in agriculture. The modern factory system has developed greatly since the formation of the Empire. The chief industrial regions are Rhenish Prussia, Westphalia, Saxony, Silesia, and the district round Berlin. All kinds of steel and iron goods are manufactured at the three great coalfields, Westphalia,

the Rhine provinces, and Saxony. The total number of spindles employed in the various textile industries has been more than doubled in the last ten years, and in the case of the woollen industry trebled. The woollen industry is still the most important, more particularly in Saxony and Silesia, where cotton and linen are also manufactured, the latter from locally-grown flax. The water-power of the Southern Highlands is increasingly used. In many cases it is first converted into electricity, which is employed for driving machinery, illumination, traction, and an increasing number of industrial and domestic purposes.

Beer is largely made in all parts of Germany. The distilling of alcohol, especially from potatoes, is an important industry along the lower Rhine and the lower Elbe. The extraction of sugar from beet-root is of great consequence in Silesia and in the lowlands between the Elbe and the Weser, where the chief centres are Halle, Magdeburg, and Hamburg. Germany has become the most important manufacturer of chemicals of all kinds, an achievement due to the careful training of experts.

Germany takes a foremost place in what may be called the higher industries, such as the making of scientific and musical instruments. Leipzig ranks with Paris and London as the great book-market of the world.

**Inland Trade and Trade-Routes.**—The main trade-routes of Germany either follow the rivers, which flow from south-east to north-west, or pass east and west across the Northern Lowlands and the valleys of the Main and the upper Danube. The large towns are all on navigable waterways.

Ulm, at the head of navigation on the Danube, lies where the Orient Express route reaches that river from the Neckar and Rhine. Regensburg (Ratisbon) is built where the route from the south by the Brenner Pass and the Inn crosses the river to the north, passing through Nürnberg (Nuremberg), on the Rednitz, famous for its toys. A canal joins the Danube system by the Altmühl to the Main. Karlsruhe, in Baden, and Darmstadt, in Hesse, are growing industrial towns on the Rhine plain. Karlsruhe is being transformed into a great river-port by the cutting of a short canal, which will join it to the Rhine.

Frankfurt-am-Main is a commercial centre, the meeting-place of many important routes—e.g. the east and west routes by the Main valley, and the north and south routes by the Rhine, or on either side of the Vogelsberg to the Weser.

Cöln (Cologne) is the most important commercial centre in the north-west, where the great routes from Paris and Brussels cross the Rhine on their way to the sea. Its woollen and cotton manufactures and distilling and engineering works are important. To the west, Aachen (Aix-la-Chapelle) is a woollen centre. To the north, round the Ruhr coalfield, many important towns have grown up. Barmen-Elberfeld produces textiles; Essen, Remscheid, and Solingen all kinds of steel and iron manufactures. Crefeld, to the west of the Rhine, has important silk-mills. Düsseldorf and Duisburg, with Ruhrort and Cöln, are the chief river-ports.

Cassel, on the Fulda, manufacturing machinery and scientific instruments; Hannover (Hanover), on the

Leine, an important railway and canal centre, producing cotton goods, chemicals, and machinery; and the great seaport of Bremen are the chief towns in the basin of the Weser.

Plauen, Zwickau, and Chemnitz are the chief towns on the Saxony coalfields which manufacture textiles. Freiberg is a mining centre. Dresden, on the Elbe, and Leipzig, on the Elster, where two tributaries join it, are both important meeting-places of many routes, and have rapidly growing industrial quarters, in which machinery and leather manufactures are carried on. Leipzig is also famous for its textiles, paper-making, and printing. Its fur and book markets control the trade in these articles in Central Europe. Dresden china is made at Meissen, on the Elbe.

There are numerous little manufactories in the valleys of Thuringia. Gotha is famous for its maps, Jena for its glass and scientific instruments. Halle, on the Saale, is an important transport centre, manufacturing sugar and salt. Magdeburg, on the Elbe, is another transport centre, in whose rapidly growing industrial quarters sugar, machinery, pottery, and paper are manufactured.

Breslau, the commercial centre of Silesia, has sugar and cotton factories. Posen, on the Warta, the chief tributary of the Oder, is an important agricultural centre, with machine-shops. Stettin, at the mouth of the Oder and at the head of the Stettiner Haff, is the seaport of Berlin. The largest vessels, however, stop at Swinemünde, on the Baltic.

Danzig, at the mouth of the Vistula, and Königsberg, at the mouth of the Pregel, are the chief ports of West and East Prussia. The peninsula of Schleswig-Holstein



is cut by the Kaiser Wilhelm Canal, which joins Kiel, on the Baltic, to Brunsbüttel, near the mouth of the Elbe. The canal recently made from the Elbe to Lübeck has greatly increased the trade of that port. Hamburg, together with its outport, Altona, is the most important port not merely in Germany but in continental Europe. The fine estuary of the Elbe permits great sea-going vessels to reach the city. Hamburg has a magnificent hinterland in the productive central portion of the German plain and in the industrial region of Saxony, and even in upper Silesia, and is the outlet for two-thirds of North Germany. Bremen, at the head of the Weser estuary, has no water-communication with such an extensive hinterland, but the proposed great canal to join the Elbe to the Rhine would give it a greater share of the eastern traffic. The imperial government is fully alive to the value of cheap water-navigation, and has matured plans for the extension and deepening of the canals. Germany has the further advantage of most of the railways being in the hands of the State.

German **ports** are favourably situated for over-sea trade with Scandinavia, the British Islands, and the seaboard countries of the world. The produce of the Rhine, however, has either to be shipped from the ports of Belgium and the Netherlands, especially Antwerp, Rotterdam, and Amsterdam, or else to be sent by a roundabout way to Bremen and Hamburg, the two German ports on the North Sea. In spite of this disadvantage, the German oceanic trade is increasing by leaps and bounds.

**Foreign Trade.**—Its central position in the heart of

Europe gives the German Empire a great advantage in trading with countries bordering its frontier, and even beyond, as the railways, except in Russia, are of one gauge, and goods can be transported without break of bulk. An illustration of the importance of this is afforded by the growth of German trade with Italy since the opening of the St Gotthard tunnel permitted direct railway communication. The upper navigable waters of the Danube, the international waterway from Eastern Europe, are within the Empire, and canals join the Rhine to the Rhone and to the Marne in the west.

Manufactured goods of all kinds form the chief exports and also the chief imports. The most important are metals, chemicals, machinery, and leather goods, of which more are exported than imported, and food-substances, textiles, and wooden wares, of which more are imported than exported. Although much German agricultural produce is exported, between three and four times as much is imported. Sugar is by far the most important commodity exported to the United Kingdom, and wood, woollen and cotton manufactures, eggs, cereals, and glass rank next. The most important articles imported from the United Kingdom are woollen and cotton goods, machinery, coal, iron, yarns, and herrings.

The trade with Britain is the most valuable, the exports and imports being nearly of equal value. Next comes that with Austria-Hungary, Russia, the Netherlands, France, Belgium, Switzerland, and Scandinavia. Of the extra-European trade, that with North America is the most important, but the imports, chiefly cereals and raw cotton, far exceed

the exports in value. Imports from Central and South America, the West Indies, and British India are likewise more valuable than the exports. With the other countries of Asia the imports and exports are almost of equal value.

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## CHAPTER XXI.

### THE LOW COUNTRIES.

#### BELGIUM.

BELGIUM, like Germany, consists of a forested region in the south—the Ardennes—bordered by a northern plain. The temperature is equable, the rainfall moderate and uniform.

**Products.**—The Campine, or eastern part of the plain, is marshy and infertile, except where it has been reclaimed. Flanders, the western part of the plain, is fertile. In parts it lies below the level of the sea, which, as in Holland, has to be kept out by dikes. The land thus reclaimed forms moist, rich meadows. The plains of Flanders, Brabant, and Hainault are cultivated with cereals, pulses, flax, tobacco, hops, chicory, and sugar-beet. Sheep are fed on the grasslands of the Ardennes. The horses of Belgium are famous.

**Minerals and Manufactures.**—Belgium is rich in minerals, more especially coal and iron. The coal-fields lie on the Meuse and Sambre, round Liège and Charleroi, and in the region west of Mons. East of Liège are large zinc-mines.

The chief manufactures of Belgium are machinery, textiles, chemicals, and glass. Flanders has long been one of the most important manufacturing districts of Europe, especially famous for its linens, which are made from locally-grown flax, and bleached in the waters of the Lys, which possess properties peculiarly suitable for that purpose. Courtrai and Ghent (Gand) manufacture cotton and woollen goods. Fine lace is made at Mechlin (Malines). In the east, wool is manufactured at Verviers. The metallurgical industries, of which the making of machinery is the most important, are carried on in the valley of the Meuse, especially round Liège.

**Trade, Towns, and Routes.**—The exports of Belgium are manufactured goods, iron, steel, machinery, textiles, sugar, chemicals, glass, and also coal and zinc. The imports are cereals, raw materials for manufacture, minerals, timber, oil-seeds, coffee, rubber, and manufactured goods.

The largest trade is with Germany, France, and Britain, the exports and imports being comparable in value. The imports from the United States, on the other hand, far exceed the exports to that country. A considerable trade is carried on with the Netherlands.

A very large transport trade takes place across Belgium between Germany and countries over-seas, mainly through Verviers, Liège, and Antwerp (Anvers), the chief port, on the estuary of the Schelde. Antwerp has a large trade with the North Sea ports, and with New York, South America, and West Africa, to which vessels run regularly. It is connected by canal and rail with the industrial region of Belgium,

for which it is the outlet. A line of railway runs south from Antwerp through Brussels and Namur to Luxemburg and Alsace-Lorraine, Switzerland, and Italy by the St Gotthard tunnel. From Brussels a line passes south-westward by Mons to Paris, westward to Ostend (Ostende), the packet-station for Dover, through Bruges, Ghent, and eastward by Liège and Cöln (Cologne) for North Germany by lines across the plain, or for South Germany by the Rhine.

### THE NETHERLANDS.

**Configuration and Climate.**—The Netherlands, or Holland, consists of the delta of the Rhine, together with the marshes between the Rhine and the Ems. Much of the country has been reclaimed from the sea by means of dikes and powerful pumps. This land, which is saturated with water, forms rich meadows known as *polders*. Canals intersect the land in all directions, and serve to drain the water-logged land, and as means of communication. So important are the dikes and canals for the very existence of Holland, that a special department of State is charged with the protection of the dikes and the regulation of the canals. Reclamation is still going on, and it is proposed to drain most of the shallow Zuider Zee, a great inland gulf running far into the heart of the country, which would add a million of acres to the Netherlands at a cost of about £27,000,000.

**Plant and Animal Products.**—The rich meadowlands are admirably suited for grazing, and cattle-raising and dairy-farming are the chief occupations. The principal agricultural crops are cereals, chiefly rye

and oats, potatoes, root-crops, beet, chicory, tobacco, and flax. The cultivation of bulbs has long been a notable occupation. The North Sea fisheries, and more particularly the herring-fisheries, occupy numerous Dutch trawlers and fishing-boats. Oysters are cultivated round the coast. Minerals are unimportant with the exception of clay, which is made into earthenware, bricks, tiles, and glass.

**Manufactures.**—Holland is deficient in coal, iron, and other minerals, and also in water-power. This has militated against the development of metallurgical and textile industries, but with the aid of imported coal some textile manufactures are carried on. The manufacture of margarine has become of great importance. Cacao, beer, gin, and various liqueurs are also made.

**Trade, Towns, and Routes.**—Much of the trade of Holland is an entrepôt trade. Cereals, flour, iron, copper, steel, and textiles figure as the most valuable items both in the list of imports and in the list of exports. They are not of Dutch origin, and are imported only to be re-exported. Among exports of Dutch origin, home or colonial, the principal are sugar, margarine, vegetables, and coffee. The chief imports for home use are wool, coal, rice, coffee, sugar, and hides.

Most of the trade of Holland is with Germany (for which it serves both as an outlet and an inlet through the ports of Rotterdam and Amsterdam), the British Isles, Belgium, the United States, and the Dutch East Indies, all of which are important customers. Canals and railways connect all parts of Holland. The Rhine is the most important waterway. Rotterdam, on the right bank of its distributary the Lek, is the chief

port. Amsterdam, the other great port of Holland, is joined to the North Sea by two canals, one running due west to Ijmuiden, the other northward to the Helder. Important passenger routes run from west to east, one from Flushing (Vlissingen) to Venlo, on the frontier, opposite to the Ruhr valley, and the other from the Hook of Holland (Hoek van Holland) to Rotterdam, whence lines diverge in all directions.

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## CHAPTER XXII.

### THE SCANDINAVIAN COUNTRIES.

#### DENMARK.

DENMARK consists of the peninsula of Jutland and of the islands between it and Sweden, of which the largest are Fyen, Zealand (Sjeland), Falster, Laaland, and the more distant Bornholm. Except in the latter, the land is low, gently undulating, and covered with meadows. One-fifth of the land is covered with peat-mosses, and one-third is under cultivation, mainly on the Baltic islands. Oats, barley, rye, beet, and potatoes are the chief crops. Dairy, pig, and poultry farming is the most important occupation, and provides over two-thirds of the exports in the form of pork, butter, eggs, and lard. The fisheries are of considerable importance. Cereals, textiles, minerals, wood, and colonial produce are the principal imports. Britain is the best customer of Denmark; next come Germany, Sweden, and Norway. Germany is the most important source of the imports; next the United Kingdom, and third the United States.

Denmark has progressed greatly since the organisation of a thorough system of technical education, and of collecting and disposing of the produce of the many dairy-farms. It also affords an excellent example of what may be accomplished in a country with very small farms whose occupiers have security of tenure.

Copenhagen (Kjöbenhavn), the capital, is the chief port on the Sound, by which most vessels enter the Baltic. Its harbour is free, and it does a large entrepôt trade. Aarhus exports much of the produce of Jutland. Routes pass westward from Copenhagen to Korsör for Kiel, to Esbjerg in Jutland for Harwich, and southward to Gjedser for Warnemünde near Rostock in Prussia. On the shorter ferries whole trains are carried by the steamers.

### NORWAY.

**Configuration and Climate.**—Norway consists of the western slope of the lofty Scandinavian plateau, lying between  $58^{\circ}$  and  $81^{\circ}$  N. Its western or seaboard edge is deeply cut by innumerable fiords, fringed by islands, forming a breakwater within which calm waters are found. The lower slopes of the plateau are covered with pine-forests. The agricultural land lies in the south-east, especially round Kristiania fiord. Most of the villages are built on the coast, either of the mainland or of the islands. The climate is mild and wet on the coasts, but cold on the plateaus.

**Productions and Occupations.**—The wealth of Norway consists in its seas and its forests. On the coast, which is the most thickly populated part of the country, every family is engaged in fishing. Crews are sent to the North Sea fisheries, as well as to the



seal and whale fisheries in polar waters. Fish-curing is an important occupation. The forests supply turpentine and timber, much of which is converted into pulp, paper, and matches. Shipbuilding is carried on all round the coast. There is some copper (Röros and Sulitelma), gold (Eidsvold), and silver (Kongsberg) mining. The Norwegians are among the great shippers of the world. The commonest investment of savings is in shipping companies.

**Trade, Towns, and Routes.**—Timber and wooden goods of various descriptions, together with fish, are the chief exports. Bread-stuffs, provisions, textiles, minerals (including coal), and iron goods of all kinds are the leading imports. Most trade is with the United Kingdom; then comes the trade with Germany and with Sweden.

Kristiania, the capital and most important port, is the centre of the agricultural and manufacturing district of the south-east. Drammen exports timber. Kristiansand, Stavanger, and Bergen are fishing and shipping centres. Tromsö, Hammerfest, and Vardö are ports within the Arctic Circle, from which vessels sail for the polar seas. Railways are not much developed. A line runs from Kristiania, by the copper-mining district of Röros, to Trondhjem. From Kristiania and Trondhjem railways pass to Sweden.

## SWEDEN.

**Configuration and Climate.**—Sweden occupies the eastern slope of the Scandinavian plateau. It differs from its western neighbour in many respects. The proportion of plain is much larger; the extremes of

temperature are more marked; the rainfall is low, and comes chiefly in summer.

**Products and Manufactures.**—The southern plains are cultivated with oats, barley, wheat, potatoes, and sugar-beet. Dairy-farming is increasing in importance. Two-fifths of the surface is forest, which is utilised in the same way as in Norway. Minerals are abundant, more particularly very pure iron ores, copper (Falun), lead and silver (Sala), and zinc (Ammeberg). The iron-mines are in the extreme north, at Gellivara, and near Dannemora, to the north of Lake Mälär. The manufacture of steel and iron goods is the principal industry in the region between Lake Mälär and the Dal. Sugar and textiles are manufactured at Stockholm, and textiles at Norrköping and Göteborg. Fishing is important round the skerry-bordered coast.

**Trade, Towns, and Routes.**—Timber alone accounts for one-half of the exports. Live animals and dairy produce and metals rank next. Coal, metal goods and machinery, raw and manufactured textile materials, colonial produce, and cereals head the imports. The best customer of Sweden is the United Kingdom, which takes three-sevenths of its exports, mainly in the form of timber and butter. Germany, Denmark, and France rank next. The imports are chiefly from Germany and the United Kingdom, followed by Denmark, Russia, and the Low Countries.

The most important port is Göteborg (in German, Gothenburg), on the Göta. Stockholm, on Lake Mälär, the capital, ranks as the second. From Stockholm a railway runs north by Upsala, with a branch to Trondhjem in Norway, to Gellivara, whence it is being continued to Port Victoria, in Norway, on the

North Sea, which will permit the exportation of iron ore all the year round. Lines run west to Kristiania and Göteborg, and south to Malmö and Karlskrona, through the manufacturing town of Norrköping. The routes to Germany are from Trelleborg to the island of Rügen, or from Malmö to Copenhagen and through Denmark (q.v.)

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## CHAPTER XXIII.

### THE UNITED STATES OF AMERICA.

THE United States lie between  $25^{\circ}$  and  $49^{\circ}$  N.—that is, between the latitudes of the Canary Islands and the English Channel on the opposite side of the Atlantic, or of Argentina in South America. The area of the United States, excluding Alaska, is over 3,000,000 square miles, about that of the Australian Commonwealth, or a little less than the mainland of Europe. They are bounded on the east by the Atlantic, on the west by the Pacific, on the north by Canada, and on the south by Mexico and the gulf of that name.

**Configuration.**—Physically the United States consist of the Appalachian Highlands in the east, the Great Plains in the centre, and the lofty Western Mountains. The eastern Appalachian Highlands are fringed by a coastal plain, which is broadest in the south. In the north, where the region has been submerged, the drowned valleys form excellent harbours, such as Chesapeake Bay and the Delaware and Hudson estuaries. Transversely, the Appalachian Highlands are broken only by the Hudson valley, which leads by Lake Champlain to the St Lawrence, and by the

Mohawk valley to the Great Lakes. These lakes form the northern boundary of the eastern part of the great Central Plains, and are a waterway into the heart of the country comparable to that formed by the Gulf of Mexico in the south. The great Central Plains stretch across the continent from the Appalachians to the foot of the Western Mountains, rising gradually to the base of the easternmost range, the Rocky Mountains. The Mississippi flows almost due south across the centre of the plains, receiving mighty tributaries, the Ohio from the east, and the Missouri, Platte, Arkansas, and Red Rivers from the west. The Western Mountains consist of a broad plateau, with numerous ranges rising above it, whose eastern parapet is formed by the Rocky Mountains, and western boundary by the Cascades and the Sierra Nevada. West of the latter is the Sacramento valley, bounded on the west by the Coast Range. The coast ranges follow the west coast throughout the United States territory, and are terminated in the north by the Strait of Juan de Fuca, which opens into Puget Sound, the drowned northern end of the valley between the Cascades and the coastal range, a continuation of the Sacramento valley in the south. Two rivers break through the coastal ranges—the Columbia in the north, and the Sacramento in the south.

**Climate.**—On the west coast the temperature is equable, but elsewhere it is one of extremes. The summer temperatures are specially high, but it must be remembered that the most northern part of the United States is nearer the equator than the most southern part of the British Isles. The warm summers rather than the cold winters determine the

nature of the plants which can be cultivated. In the extreme south the inflowing winds bring summer rains, which fall over the whole of the Central Plains. Depressions pass over the plains in winter, drawing moist air from the Gulf of Mexico, and causing winter rains. Thus, east of a line drawn from the west of the Gulf of Mexico to Lake Michigan, the precipitation is considerable at all seasons. California has a Mediterranean climate of dry summers and cold winters.

**Economic Divisions.**—In the north the economic divisions are the same as in southern Canada. In the west the slopes of the Western Mountains are densely forested, but the arable plains of the Columbia and Sacramento Rivers are wider than those of British Columbia. On the Plains the ranching area is greater, owing to the extension eastward of the region of low rainfall. The forest belt extends along the borders of the Great Lakes, and is continued over the whole of the Eastern Highlands to the Atlantic coastal plain.

In the extreme south the economic conditions are of an entirely different type. The Gulf coastal plain produces cotton, rice, and, farther north, tobacco and maize. Maize is grown in every state of the Union except in the extreme north. It is most important between the Ohio and the lower Missouri and in eastern Nebraska and Kansas. Tobacco can be cultivated as far north as the Connecticut valley. For export it is grown principally in Kentucky, Virginia, and North Carolina, and in the adjacent states. Wheat is cultivated most extensively between the Appalachians and 100° W. to the north of 36° N., and in the Sacramento and Oregon valleys. In Cali-

ifornia the vine comes to perfection on the hill-slopes, especially in the south, where all Mediterranean fruits are cultivated. In the drier states of the west, irrigation is leading to a considerable development of agriculture.

**Minerals.**—The mineral regions described in southern Canada extend across the frontier into the United States. Gold is found in small quantities in the east, and is very abundant in the Western Mountains, especially in Colorado and California. Silver is very important, and is mined in Colorado, Montana, Nevada, and many other states. Mercury is obtained from New Almaden in California, copper from Montana and the north of Michigan, zinc from Kansas and Missouri. In addition to building stone and clay, the most useful minerals are oil, coal, and iron, all of which are found in large quantities. The oil region is in Ohio and western Pennsylvania. The most important coalfield is in north-east Pennsylvania, where fine anthracite is mined. Coal, however, is very widely distributed all along the western margin of the Appalachians, round the lower Missouri, and between this region and the Ohio. Iron is most abundant in the States of Michigan, Wisconsin, and Minnesota. It is sent across Lake Erie to be smelted with coal and oil fuel from the eastern coalfields, especially at Pittsburg (Penn.) and at Cleveland (O.), the latter of which receives abundant limestone to act as a flux from neighbouring islands in Lake Erie. The Appalachian region from the Delaware to the Gulf of Mexico is the other iron-producing region. The ore is smelted at Birmingham (Ala.), where coal and limestone are also found.

**Manufactures.**—The vast stores of coal, iron, and oil naturally led to great manufacturing activity as soon as population became sufficiently dense in the east to supply the necessary hands and markets. The United States is now the most important manufacturing country in the world, with an output nearly twice that of the United Kingdom, most of it being consumed at home.

The manufactures of the United States may be classified under four heads: those concerned with the elaboration of forest products; those concerned with the manufacture of pastoral and agricultural produce; the manufacture of textiles and articles of clothing; and the metallurgical industries, including transport materials.

Lumbering is an important industry round all the Great Lakes, and the forests of the north-western mountains of Oregon and Washington also supply valuable timber. Where water-power is available, saw-milling, coopering, and the manufacture of wood-pulp, paper, and furniture spring up at suitable centres in the forest regions. Most of the towns of the Great Lakes are thus engaged, especially Detroit.

Flour-milling is important at Minneapolis, Superior, and other towns, which combine water-power with easy access to the great wheat-lands of the Dakotas and Minnesota. Maize, used as a food for man and beast, is also made into starch and glucose, which is fermented and distilled. The ranching area has given rise to an enormous trade in preserved meat. Cattle from the western ranches and hogs fattened on maize on the eastern plains are brought to the meat-packing cities to be slaughtered and

canned. Chicago and Omaha are the largest centres for cattle-slaughtering, and Chicago is also the centre of the pork-packing trade. It is an interesting fact, economically, that the centres of this trade have moved far to the west within the last forty years, owing to the rapid extension of settlement and agriculture west of the Mississippi, and the consequent pushing westward of ranching. In the seventies Cincinnati, often called Porkopolis, occupied the same position in the meat-packing trade as Chicago does to-day. Tobacco is manufactured in Virginia, West Virginia, and North Carolina; Louisville, in Kentucky, and Richmond, Virginia, being among the chief tobacco markets of the world. West Indian sugar is refined at Philadelphia.

The textile industries have developed in the long-settled and thickly-peopled north-eastern states, which possess a moist climate, water-power, and easy access to the coalfields of the north and the cotton plantations of the south and to a large market. Manchester (New Hampshire), Lowell and Lawrence (Mass.), all on the Merrimac; New Bedford and Fall River, the most important centre, in southern Massachusetts; and Providence, in Rhode Island, are famous for cottons. A chain of towns, engaged in textile and other manufactures, has grown up along the Appalachian 'fall-line,' where the rivers form rapids and falls in passing from the highlands to the coastal plain. Recently the manufacture of local cotton has been begun in the cotton-growing states, and is developing rapidly—for instance, at Atlanta, in Georgia; and spinning-mills now occupy the site of what was recently virgin forest in Texas. Woollen manufactures are growing in importance, and the demand for woollen goods is great owing to



the cold winters. The chief centre is Philadelphia (Pa.), but at Lawrence and Lowell in Massachusetts, Providence (R.I.), New York City, and other towns of the coastal states from Pennsylvania northward woollen goods are made. The woollens are manufactured into ready-made clothes at New York, Philadelphia, Chicago, Boston, and all the great cities. Many New England towns are noted for their machine-made boots and shoes (Lynn, Mass.), and for hardware of all kinds (Hartford, Conn.).

The metallurgical industries are carried on in the coal and iron regions. The great iron-manufacturing centres are Pittsburg, in eastern Pennsylvania; Chicago, in Illinois; and Birmingham, in Alabama. The making of machinery is carried on in all the great cities, especially Philadelphia, Chicago, and New York. Chicago, Buffalo, Detroit, and Worcester (Mass.) make railway plant. Philadelphia is noted for its locomotives, and here and at San Francisco steel ship-building is developing.

The United States is only at the beginning of its career as a manufacturing nation. Its enormous command of raw material, of fuels, such as coal and oil, and its great and growing population fit it to take the leading place in the future. The industrial development of the United States, however, should not be compared with that of one of the states of Europe, but with the whole. The great advantages of the American United States is that the highest intelligence is brought into industrial life, which is unhampered by the undue conservatism of the Old World. New and improved methods are promptly adopted; machinery and processes are never allowed

to become antiquated; and though labour is more costly per head, it is more intelligent and energetic, and consequently, in the long-run, cheaper than in the older manufacturing countries of the world, although it may not be so persistent nor so thorough.

**Internal Communication.**—There are over 20,000 miles of navigable waterways in the United States, the most important of which are the Great Lakes and the Mississippi. Over 9000 miles of river are navigable in the Mississippi basin, and the tonnage transported on the Ohio system is over 15,000,000 tons per annum. Only the lower courses of the Appalachian rivers across the coastal plain are important, except in the case of the Hudson, which crosses the Appalachian barrier from north to south, is navigable for ocean steamers for 100 miles, and carries over 18,000,000 tons per annum. On the Pacific coast the Columbia is navigable for 500 miles, and the other large rivers for 100 to 150 miles.

The traffic on the Great Lakes is vast, and continually increasing. The annual tonnage passing through the Soo Canal, between Huron and Superior, is 25,000,000 tons ( $=2\frac{1}{2}$  times that of the Suez Canal). The Lakes bring east the produce of the western plains, the lumber of the surrounding forests, and the minerals of Wisconsin and Montana, while they carry west the textiles, machinery, and other manufactured goods of the east. The chief ports are Duluth, on Lake Superior; Milwaukee and Chicago, on Lake Michigan; and Cleveland and Buffalo, on Lake Erie. The Erie Canal avoids the Niagara Falls, and connects Lakes Erie and Ontario with the Hudson by the Mohawk valley.

The coasting traffic is also very great, and is carried on only by vessels flying the United States flag.

The railway system of the United States is very highly developed, especially in the east and north-east of the central plain, radiating from Boston, New York, Philadelphia, Buffalo, Cincinnati, Chicago, St Louis, and many other centres, with ramifications too complex for summary here. From Chicago, the greatest railway and transport centre in the world, four lines cross the continent. The first in order of construction was the Union Pacific, which goes by Omaha and the Great Salt Lake to San Francisco, with a branch line which runs north-west to Portland in Oregon. The Great Northern runs parallel to the Canadian frontier, at no great distance south of it, to Tacoma on Puget Sound. The North Pacific also runs parallel, but farther south, by Bismarck in Missouri, and Helena in Montana, to Portland. The Topeka and Santa Fé line goes by New Mexico and Arizona to southern California. A line connects San Francisco with Portland, Tacoma, and other Pacific cities. A fifth trans-continental line, the Southern Pacific, starts from San Francisco, and skirts the Mexican frontier and Gulf to New Orleans, from which radiates a network of lines to every part, through Cairo and St Louis to Chicago, through Louisville to Cleveland, and through Atlanta to New York and Boston.

**Internal and Foreign Trade.**—Until the closing decade of the nineteenth century, the exports of the United States were mainly the produce of its forests, farms, plantations, and ranches, swollen at times by considerable quantities of gold and silver. These are still the most important, but no longer the sole exports.

Cereals, especially wheat and maize, rank first in value, followed by raw cotton. Tinned meats and other products of the ranches, and cheese from the east, where dairy-farming is largely carried on, live-stock, leather, hides, timber, minerals, and oils are all important.

The closing years of the nineteenth century were marked by a remarkable development of the export trade in manufactured articles, more especially iron. In 1885 the exports of iron and steel were worth only half as much as the imports. In 1890 they had risen in value to five-eighths; in 1895 they had reached half as much again as the imports, and in 1900 the extraordinary figure of six times as much. Iron and steel goods now rank fourth in value on the list of American exports. The imports are manufactured goods, more particularly textiles, sugar, coffee, hides, india-rubber, and other raw materials. With the development of the last ten years the imports are changing in character and relative value. Raw materials for manufacture amounted in 1900 to half the total value of the imports, against one-third in 1890.

The chief trade of the United States is with Europe, and more particularly with the United Kingdom, which accounts for from two-fifths to one-half of its total domestic exports, while supplying only one-third of the imports—a larger proportion, however, than any other country. Germany is the next best customer of the United States. France, the Low Countries, and Italy are next on the list, and direct communication has recently been started between New York and Genoa. The trade with Canada is a little more than that with France. In the case of Mexico the imports

and exports nearly balance, while from the South American states the imports considerably exceed the exports, more particularly in the case of Brazil, from which much cotton and coffee are obtained. The imports to the United States also exceed the exports from it in the case of India, China, Japan, and the East Indies; but the exports are increasing, especially to China. The exports to Australia, on the other hand, far exceed the imports in value, and are rapidly growing.

The United States are now in regular communication with the United Kingdom, Germany, the Low Countries, France, and Italy, and no effort is spared to render the trans-Atlantic service as rapid as possible. The passage has been accomplished from New York to Southampton in five and a half days, and this record will no doubt soon be broken. New York is the chief terminus of the cross-Atlantic traffic, but regular lines of steamers also run to and from Portland (Maine), Boston, Philadelphia, Baltimore, Savannah and other South Atlantic ports, New Orleans, Galveston, and other Gulf ports.

A considerable change has taken place in the relative importance of these cities as exporting centres. Forty years ago New York had 46 per cent. of this trade, and New Orleans 15 per cent. Now New York has only  $37\frac{1}{2}$  per cent., while Boston, Baltimore, and Philadelphia have profited; New Orleans has now  $6\frac{1}{3}$  per cent., and Galveston has secured the proportion of trade New Orleans has lost. Boston has grown with the increased export of manufactured goods; Philadelphia is also partly affected by this, and, with Baltimore, is nearer the tobacco and maize growing districts than

New York, although access is not so easy to the central plain.

Galveston has increased in importance with the development of Texas, of which it is the port. Taking into account both export and import trade, the following are the percentages of the different ports, in which the predominance of New York, the chief importing centre, is much more marked than when exports alone are considered:—New York, 47·0 per cent.; Boston, 8·2 per cent.; Baltimore, 6 per cent.; New Orleans, 5·9 per cent.; Philadelphia, 5·4 per cent.; Galveston, 3·9 per cent.; and San Francisco, 3·4 per cent.

In 1901 the first through steamer sailed for Chicago, which is now practically an ocean port, from Manchester, which is also naturally an inland town.

The trans-Pacific service is less important at present than the trans-Atlantic, but regular lines of steamers sail from San Francisco to Japan, China, the Philippines, and Australasia. The export trade of San Francisco, however, is still chiefly with Europe, and a relatively large proportion of the trade with Britain is carried on by sailing-ships. The opening of the Panamá Canal will give a great impetus to the trade between the eastern ports and ports on the Pacific.

# APPENDIX.

## STATISTICS, MONEY, WEIGHTS, AND MEASURES.

### BRITISH POSSESSIONS.\*

#### CANADA.

Imports for Home Consumption.	1902.	1900.	Exports of Canadian Produce.	1902.	1900.
	1,000 Dol.	1,000 Dol.		1,000 Dol.	1,000 Dol.
Iron, Steel, and Manufactures of.....	24,072	29,300	Wood, Wood Pulp, &c. ....	35,389	32,791
Coal and Coke.....	13,841	11,519	Cheese .....	19,686	19,856
Wool, Manufactures of.....	10,947	9,802	Wheat and Wheat Flour.....	22,657	14,787
Sugar of all kinds	8,746	8,603	Gold - bearing Quartz.....	19,668	14,149
Coin and Bullion..	6,311	8,297	Bacon.....	12,163	12,472
Cotton Manufactures.....	7,393	6,475	Fish.....	14,143	11,169
			Miscellaneous Agricultural Products.....	14,595	10,151
			Cattle.....	10,664	9,081
			Butter.....	5,660	5,122

#### PROGRESS OF THE LEADING CLASSES OF CANADIAN EXPORTS.

Exports.	1896.	1898.	1900.	1902.
	1,000 Dol.	1,000 Dol.	1,000 Dol.	1,000 Dol.
Animals and their Produce..	36,508	44,301	56,148	59,161
Manufactures.....	30,477	31,179	39,397	18,462
Agricultural Produce.....	14,084	33,063	27,517	37,153
Produce of the Fisheries.....	11,078	10,842	11,169	14,143
Produce of the Mines.....	8,060	14,460	24,575	34,948
Produce of the Forests.....	6,068	6,013	4,496	32,119

\* The statistics are compiled from the *Statesman's Year Book* for 1901, 1902, and 1903, or directly from official returns. Where three years' figures are given, the order of commodities is that of the returns of the middle year.

CANADA—*Continued.*

## EXPORTS.

Exports to	1902.	1900.
	1,000 Dollars.	1,000 Dollars.
Great Britain.....	117,320	107,736
United States.....	71,198	68,619
West Indies.....	3,299	2,870
Germany.....	2,693	1,716
South America.....	1,782	2,148
Newfoundland.....	2,381	2,144

*Money.*—Dollar=100 cents=4s. 2d. nearly; £1=4·86 dollars.

*Weights and Measures.*—English, except that a hundredweight = 100 lb., and a ton=2000 lb. avoirdupois.

## NEWFOUNDLAND AND LABRADOR.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Flour.....	240	281	300	Dried Cod.....	1,063	1,121	913
Textiles and Apparel.....	203	206	235	Copper and Ore.....	80	127	60
Hardware.....	84	85	52	Tinned Lob- sters.....	92	91	116
Salt Pork.....	74	64	70	Seal Oil.....	87	89	52
Molasses.....	38	58	46	Iron Ore and Pyrites.....	94	88	66
Leather.....	53	44	32	Cod Oil.....	82	62	54
Tea.....	33	30	33	Seal Skins....	58	33	28
				Pickled Her- ring.....	35	30	34

*Money.*—1 dollar=4s. 1½d.



## NEW ZEALAND.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Clothing, and Materials for.....	2,475	2,420	2,123	Wool.....	3,699	4,749	4,325
Iron and Steel Goods, Ma- chinery, &c.	2,462	2,133	1,579	Frozen Meat.	2,253	2,124	2,089
Sugar .....	490	452	355	Gold .....	1,754	1,440	1,513
Paper, Books, Stationery.	439	407	369	Grain, Pulse, Flour .....	1,294	1,049	732
Beer, Spirits, Wines .....	343	288	306	Butter and Cheese .....	1,121	970	714
Fruit .....	249	226	181	Kauri Gum...	446	622	608
Oils .....	238	207	127	Hides, Skins, Leather .....	477	476	484
				Tallow .....	352	368	312
				Phormium (N.Z. hemp)	196	332	184

*Coinage, Weights, and Measures.—British.*

## COMMONWEALTH OF AUSTRALIA.

*(Money, Weights, and Measures as in Britain.)*

## TASMANIA.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Drapers' Goods	437	437	380	Copper and Copper Ore.	1,027	902	762
Hardware .....	131	131	106	Fruit .....	331	280	244
Sugar .....	114	114	104	Tin .....	213	271	282
Machinery .....	112	112	99	Wool .....	280	261	358
				Silver and Sil- ver Ore .....	325	252	209
				Gold .....	204	207	206

COMMONWEALTH OF AUSTRALIA—*Continued.*

## VICTORIA.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Wool (raw)...	1,840	1,928	2,351	Wool.....	4,351	4,217	5,701
Gold (mostly Bullion)....	919	1,264	2,628	Gold (mostly Specie).....	4,297	4,132	4,387
Cottons.....	1,032	1,045	986	Butter .....	1,245	1,490	1,405
Iron and Steel	897	936	847	Wheat.....	1,444	892	1,252
Live-Stock ...	1,092	898	767	Live-Stock....	688	706	352
Woollens.....	722	774	674				
Sugar.....	877	697	684				
Timber .....	600	569	441				
Coal and Coke	450	407	280				

## SOUTH AUSTRALIA.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Ore.....	1,551	2,300	1,666	Wool.....	1,029	1,003	1,512
Apparel and Drapery....	400	428	375	Wheat and Flour.....	1,280	837	761
Coal and Coke	362	396	307	Silver.....	659	638	585
Sugar.....	364	375	139	Lead.....	497	674	461
				Copper.....	469	372	406

## QUEENSLAND.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Textiles and Apparel.....	1,227	1,435	1,549	Gold.....	2,197	2,475	2,614
Metals and Metal Goods	959	1,258	957	Wool.....	2,139	2,199	3,391
Flour.....	240	270	275	Meat and Meat Ex-tract.....	1,320	1,562	1,494
				Sugar.....	789	669	1,163
				Live-Stock...	713	597	927
				Hides and Skins.....	419	552	700

COMMONWEALTH OF AUSTRALIA—*Continued.*

## NEW SOUTH WALES.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Gold.....	3,756	4,389	3,155	Wool.....	9,467	8,343	11,739
Drapery and Apparel.....	3,575	3,644	3,070	Gold.....	4,813	5,850	4,412
Iron and Steel	1,218	1,391	1,137	Silver Ore...	1,580	2,163	1,492
Machinery....	989	867	656	Coal.....	1,682	1,273	1,006
Live-Stock....	745	843	924	Live-Stock..	868	1,157	1,304
Sugar (unre- fined).....	750	734	743	Meat.....	910	852	665
Wool.....	416	695	1,589	Hides and Skins.....	760	757	1,036

## WESTERN AUSTRALIA.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Drapery and Apparel.....	633	666	465	Gold.....	5,550	6,750	5,531
Machinery....	495	540	416	Timber.....	646	498	583
Iron and Steel	379	497	294	Wool.....	378	271	423
Butter.....	248	204	184	Pearl-Shell...	106	87	91
Spirits and Ales.....	172	170	141	Skins.....	64	54	62

## CAPE OF GOOD HOPE.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Food, Drink, &c. ....	7,185	5,585	3,705	Diamonds....	4,930	3,434	4,136
Textiles, Dress, &c.	5,066	4,301	3,941	Ostrich Fea- thers.....	839	877	842
				Wool.....	1,489	838	2,184
				Copper Ore...	571	499	447
				Hair (Angora)	502	490	780
				Hides and Skins.....	448	347	408
				Raw Gold....	1,226	337	13,816

*Money, Weights, and Measures.*—British. Old Dutch measures are still employed, especially the muid = 3 bushels, and the morgen = 2.1 acres.

## NATAL.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Machinery....	312	669	328	Wool.....	254	161	609
Haberdashery	639	409	421	Sugar.....	114	148	147
Apparel and Slops.....	534	375	337	Coal.....	410	139	155
Iron and Hardware..	353	368	512	Bark.....	70	46	58
Flour, Grain, &c.....	253	268	347	Gold.....	...	1	403

*Coinage, Weights, and Measures.—British.*

## CEYLON.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Rs.	1,000 Rs.		1,000 Rs.	1,000 Rs.
Rice and other Grains.....	36,972	40,125	Tea.....	47,611	53,735
Coal and Coke...	12,721	12,243	Coco-Nut Pro- ducts.....	17,971	16,438
Cotton Goods....	6,192	7,918	Plumbago.....	9,610	9,792
Salt Fish.....	3,264	3,357	Cacao.....	2,321	1,651
Spirits and Wines.....	1,045	1,892	Areca Nuts.....	1,612	1,598
			Coffee.....	537	593

*Money.—1 rupee=100 cents=1s. 4d. Weights and Measures.—British.*

## THE STRAITS SETTLEMENTS.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Dol.	1,000 Dol.		1,000 Dol.	1,000 Dol.
Rice.....	31,436	25,101	Tin.....	60,231	60,768
Opium.....	14,617	15,496	Gums.....	19,281	19,136
Cotton Piece Goods.....	14,824	14,789	Spices.....	14,762	14,527
Coal.....	7,677	7,979	Gambier.....	7,251	6,681
Fish.....	7,367	6,757	Rattans.....	6,611	6,780
			Tapioca and Sago	6,716	6,780

*Money.—The silver Mexican dollar=ca. 2s. The British or Hong-kong dollar is also legal tender. Weights and Measures.—1 picul=100 kati=133½ lb. Other values are also used.*

## INDIA.

Countries.	Imports into India.			Exports of Indian Produce.	
	1901-1902.	1900-1901.	1899-1900.	1900-1901.	1899-1900.
	1,000 Rs.	1,000 Rs.	1,000 Rs.	1,000 Rs.	1,000 Rs.
United Kingdom .....	525,563	486,760	487,531	313,775	308,839
Austria-Hungary .....	39,397	31,368	23,833	27,074	17,012
China .....	17,908	25,472	15,964	117,428	140,655
Straits Settlements..	23,819	23,170	19,356	68,581	54,931
United States .....	11,789	12,500	12,421	72,170	76,148
Belgium .....	30,133	24,305	24,299	35,479	34,115
Germany .....	30,373	26,030	16,848	92,062	75,138

Imports.*	1901-1902.	1900-1901.	Exports.*	1901-1902.	1900-1901.
	1,000 Rs.	1,000 Rs.		1,000 Rs.	1,000 Rs.
Cotton Manufactures .....	328,950	298,353	Jute, raw and manufactured	205,087	187,323
Metals, Hardware, Cutlery .....	86,111	82,729	Cotton, raw and manufactured .....	252,914	158,304
Sugar, refined and unrefined	58,521	56,552	Rice .....	139,190	132,191
Oils .....	42,189	37,570	Hides and Skins .....	82,307	114,826
Silk, raw and manufactured	22,943	26,827	Tea .....	81,495	95,509
Machinery and Mill-work ....	30,059	22,576	Opium .....	85,230	94,554
Woollens .....	19,695	21,126	Seeds (Oil Seeds mainly)	167,793	90,140
			Indigo .....	18,523	21,360

*Weights, Measures, and Currency.*—The metric measures have been legalised, but are not used. The unit of measure is the maunde, which varies from 25 lb. in Madras, and 28 lb. in Bombay, to over 82 lb. in Bengal.

Indian statistics are usually expressed in rupees, ten of which nominally form £1. The exchange value has depreciated in recent years, so that the rupee is not worth 2s., but only about 1s. 4d. Most statistics are expressed in tens of rupees (Rx.). 100,000 rupees is called a lac, 10,000,000 rupees a crore. The rupee is divided into 16 annas, each of which at present, therefore, is equal to one penny.

\* Excluding goods imported for re-export.

## MAURITIUS.

Imports.*	1900.	1899.	Exports.	1900.	1899.
	1,000 Rs.	1,000 Rs.		1,000 Rs.	1,000 Rs.
Cotton Goods....	77	106	Unrefined Sugar.	28,836	23,045
Manure .....	59	35	Aloe Fibre.....	940	566
Coal.....	29	20	Rum.....	224	155
			Vanilla.....	170	134
			Coco-Nut Oil.....	46	28

*Money.*—1 rupee=1s. 4d., as in India. *Weights and Measures.*—Metric.

## ZANZIBAR.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Piece Goods..	298	256	368	Piece Goods..	268	265	346
Rice .....	130	159	193	Cloves.....	164	158	197
Ivory.....	114	95	113	Ivory.....	115	115	127

*Money.*—Maria Teresa dollar=2 rupees 2 annas. Rupee is current.

## BRITISH WEST INDIES.†

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Cottons.....	1,912	418	492	Cocoa.....	457	626	442
Apparel.....	217	204	243	Sugar.....	509	367	426
Iron.....	117	103	104	Spices.....	89	122	135
Leather and Saddlery...	80	90	108	Rum.....	207	105	139
Manure.....	81	76	69	Wood.....	25	38	25
Machinery...	73	52	52	Fruits.....	190	36	38
Beer and Ale.	60	59	70				

*Currency, Weights, and Measures.*—British. American coins accepted in some islands.

\* Figures for Great Britain only.

† Figures for trade with United Kingdom only.

## WEST AFRICAN COLONIES.

## LAGOS.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Cotton Goods	327	331	308	Palm Kernels	511	404	413
Spirits .....	61	54	62	Palm Oil.....	207	190	168
Tobacco .....	19	18	20	Rubber .....	15	48	160

## GOLD COAST.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Cotton Goods	343	285	307	Rubber .....	104	328	556
Spirits .....	150	108	101	Palm Oil.....	178	238	183
Tobacco.....	34	25	30	Palm Kernels	90	96	106
				Kola Nuts....	35	43	57
				Gold-Dust....	22	38	51

## SIERRA LEONE.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Cotton Goods	138	134	185	Palm Kernels	162	172	163
Spirits .....	48	16	...	Kola Nuts....	51	79	61
Tobacco.....	20	27	29	Rubber .....	9	46	44

## GAMBIA.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Cotton Goods	44	61	51	Ground Nuts.	172	222	200
Spirits .....	5	3	5	Rubber.....	9	10	30
Tobacco .....	7	5	4				

*Currency, Weights, and Measures.—British.*

## STATISTICS OF NON-BRITISH LANDS.

## ARGENTINE REPUBLIC.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Dol.	1,000 Dol.		1,000 Dol.	1,000 Dol.
Textiles and Apparel.....	32,948	37,598	Animals and their Products.	90,646	71,254
Iron and Manufactures of Iron	19,054	19,054	Agricultural Products.....	71,596	77,426
Alimentary Products.....	10,954	10,453	Forest Products.	2,821	3,509
Pottery, Glass, &c.....	10,155	8,893	Products of the Chase.....	940	990
Beverages.....	7,091	7,278			
Timber and Woodwork....	7,340	7,041			
Oils, mineral, &c. ....	4,504	4,194			

*Money.*—The dollar is nominally worth 4s. The paper dollar is worth a little over 1s. 9d.

*Weights and Measures.*—Metric.

## AUSTRIA, INCLUDING BOSNIA AND HERZEGOVINA.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Cr.	1,000 Cr.		1,000 Cr.	1,000 Cr.
Raw Cotton.....	135,597	144,136	Sugar.....	176,693	186,551
Coal, Coke, &c.	107,820	112,317	Eggs.....	96,708	99,262
Wool (washed, raw, carded)..	90,213	88,886	Lignite.....	81,244	69,560
Silk and Manufactures.....	71,754	74,324	Cattle.....	66,391	61,768
Tobacco.....	56,206	55,551	Malt.....	46,164	50,802
Machinery.....	42,341	51,978	Wood and Woodwork....	44,274	254,295
Hides and Skins	46,349	49,968			
Coffee.....	41,008	48,100			



## HUNGARY.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Cr.	1,000 Cr.		1,000 Cr.	1,000 Cr.
Cotton Goods...	133,466	124,518	Flour.....	166,992	156,628
Woollen Goods.	85,214	81,233	Oxen.....	88,360	92,361
Clothing.....	36,817	37,441	Wheat.....	79,480	84,646
Silk Goods.....	24,554	28,194	Pigs.....	63,345	59,477
Wine (in casks)	19,018	24,124	Barley.....	44,063	56,720
Coal.....	22,287	20,316	Rye.....	34,135	47,807
			Eggs.....	30,634	34,497

*Money.*—The unit is the krone or crown = 10d. (cf. the franc). Formerly the gulden or florin was used = 1s. 8d.

*Weights and Measures.*—Metric.

## BELGIUM.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Fr.	1,000 Fr.		1,000 Fr.	1,000 Fr.
Cereals.....	328,038	297,872	Raw Textiles ...	...	112,235
Raw Textiles...	209,659	214,904	Coal.....	127,708	111,796
Resins, Bitumen	...	92,873	Yarns, Linens,		
Timber.....	112,551	85,515	&c. ....	...	79,406
Chemicals.....	65,431	72,401	Glass.....	79,347	76,840
Coal.....	54,954	70,486	Cereals.....	72,271	65,413
Raw Hides .....	54,755	64,696	Sugar.....	54,627	59,520
Machinery.....	42,379	54,861	Machinery.....	71,285	57,711
Caoutchouc.....	45,370	52,057	Zinc.....	44,156	49,617
Drugs.....	31,238	47,051	Raw Hides.....	51,069	47,856
Oil Seeds.....	...	40,256	Iron.....	66,675	75,656
Iron and Ore....	29,731	...			

*Money.*—Latin Monetary Unions unit is the franc;  $25\frac{1}{2}$  francs = £1.

*Weights and Measures.*—Metric.

## BRAZIL.

Imports from Great Britain.	1901.	1900.	1899.	Exports to Great Britain.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Cottons and Yarn.....	1,112	1,646	1,775	Caoutchouc..	3,747	4,322	3,089
Coal, Cinders, &c.....	722	804	621	Raw Cotton..	270	670	97
Ironwork.....	344	535	617	Coffee.....	238	91	143
Machinery....	277	413	399	Manganese			
Telegraph Wire, &c...	28	388	34	Ore.....	76	192	80
Jute Yarn and Goods.	368	278	234	Cotton-Seeds	67	115	54
				Cocoa.....	88	112	71

*Money.*—1 milreis=2s. 2½d. ; paper milreis=6d. to 8d.

*Weights and Measures.*—Metric. Old sometimes used.

## BULGARIA.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Leva.	1,000 Leva.		1,000 Leva.	1,000 Leva.
Textiles.....	25,590	13,297	Grain.....	51,717	27,128
Metals and Metal Goods.....	6,209	5,198	Live-Stock.....	8,220	5,609
Colonial Goods....	4,434	3,984	Textiles and Cocons.....	4,781	4,324
Machinery, Implements, &c.....	4,474	2,786	Hides, Skins, &c..	3,647	3,725
Hides, Skins, Leather.....	4,601	2,353	Otto of Roses.....	2,140	3,719

*Money.*—1 leva=1 franc. (See France.)

## CHILE.

Imports.	1901.	Exports.	1901.
	1,000 Pes.		1,000 Pes.
Textiles and Manu- factures.....	40,151	Mining.....	158,944
Vegetable Materials....	27,183	Agricultural.....	4,481
Minerals.....	22,373	Animals and their Products.....	4,340
Industrial Oils, &c.....	20,087	Manufactures.....	3,462
Machinery, Tools, &c....	9,632		
Animals.....	9,141		

*Money.*—13½ pesos = £1 ; 1 peso = 1s. 6d.

*Measures.*—Metric. Old Spanish sometimes used.

## CHINA.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Hai- kwan Taels.	1,000 Hai- kwan Taels.		1,000 Hai- kwan Taels.	1,000 Hai- kwan Taels.
Cotton Goods.	99,652	75,606	Silk, raw and manufactured	60,916	49,444
Opium.....	32,937	31,031	Tea.....	18,513	25,445
Oil, Kerosene.	17,293	13,956	Raw Cotton...	4,706	9,861
Rice.....	7,051	11,377	Beans, Bean- cake.....	8,571	5,468
Metals.....	10,429	9,178	Straw Braid...	3,590	4,371
Sugar.....	13,457	6,424	Hides, Skins, &c.....	8,559	...
Coal.....	8,352	6,388			

*Money.*—1 copper cash = about  $\frac{1}{10}$ d. ; 1600-1700 cash = 1 haikwan tael = about 2s. 10½d. The silver dollar = Mexican dollar and Japanese yen, is also legal.

*Weights and Measures.*—16 tael = 1 kati or catty or kin ; 100 kati = 1 picul (tan) = 133½ lb. ; 1 chih or foot = 14.1 inches ; 10 chih = 1 chang ; 1 li = 3 cables.

## DENMARK.

Imports.	1901.	1900.	1899.
	1,000 Kroner.	1,000 Kroner.	1,000 Kroner.
Cereals.....	72,238	66,873	73,509
Textiles .....	52,923	58,372	55,221
Provisions, Eggs, &c.....	82,982	71,484	...
Coal .....	35,819	47,362	35,346
Metals and Hardware.....	37,723	67,881	47,224
Colonial Goods.....	40,378	44,534	39,853

Exports.	Gross.		Home Produce only.*	
	1901.	1900.	1901.	1900.
	1,000 Kroner.	1,000 Kroner.	1,000 Kroner.	1,000 Kroner.
Provisions, Eggs, &c..	280,413	254,881	235,639	216,932
Animals .....	19,862	21,852	19,838	21,818
Cereals, &c. ....	14,884	13,339	7,981	8,701
Metals and Hardware	9,585	12,079	3,478	3,970

*Money.*—1 krone=100 öre=1s. 1½d.

*Weights and Measures.*—1 pund=1·1 lb.; 1 centner=100 pund=110·2 lb.; 1 alen=2 fod=0·69 yard.

\* These figures throw an interesting light on modern commerce.

## EGYPT.

Imports.	1901-1902.	1900-1901.	Exports.	1901-1902.	1900-1901.
	1,000 £E.	1,000 £E.		1,000 £E.	1,000 £E.
Textiles.....	4,581	4,642	Textiles, mainly Raw Cotton	13,949	11,892
Wood and Coal, Cane-work, &c.....	2,026	2,139	Cereals, Vegetables, &c.....	2,658	2,650
Metals and Metal Goods.	1,726	1,744	Provisions and Drugs.....	601	804
Cereals, Vegetables, &c....	1,418	1,706			
Spirits, Oils, &c.....	799	813			
Animals and Animal Food Products.....	702	685			
Tobacco.....	604	596			
Provisions and Drugs.....	466	415			

*Money.*—1 gold Egyptian pound = 100 piastres = £1, 0s. 6½d.

*Weights and Measures.*—1 kantar = 100 rottles = 36 okes = 99 lb.; 1 ardeb = 5·45 bushels.

## FRANCE.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000,000 Francs.	1,000,000 Francs.		1,000,000 Francs.	1,000,000 Francs.
Wool .....	362	426	Textiles, Wool,		
Coal and Coke..	343	407	Silk, Cotton..	657	660
Raw Silk.....	273	248	Wine .....	228	228
Raw Cotton ....	239	248	Smallware .....	183	185
Oil Seeds...	213	189	Raw Wool and Yarn.....	164	202
Cereals.....	185	127	Raw Silk and Yarn.....	117	136
Timber and Wood.....	178	177	Linen and Clothes.....	127	136
Hides and Furs.	151	161	Skins and Furs.	139	110
Wine.....	85	155			
Textiles.....	152	152			

*Currency.*—The unit of the French coinage is the franc, worth about 9½d., and divided into 100 centimes. The gold and silver coinage of Belgium, Italy, Switzerland, and Greece are based on the same units,

and being of the same fineness, size, and weight, are generally accepted. The same monetary system has been adopted, either wholly or partially, in Spain, Rumania, Bulgaria, Servia, Finland, and several South American states.

*Weights and Measures.*—The unit of length is the meter, 39·4 inches approximately. It is subdivided into tenths or decimeters, hundredths or centimeters, and thousandths or millimeters. A centimeter is  $\frac{1}{2}$  and a millimeter  $\frac{1}{8}$  of an inch. The unit of distance is the kilometer, measuring 1000 meters, or  $\frac{1}{2}$  mile. The square kilometer is about  $\frac{1}{4}$  of a square mile, and contains 100 hectares, each about 2½ acres.

The unit of weight is the gram (gramme). 1000 grams, or about 2½ lb. avoirdupois, make a kilogram. In ordinary retail trade most goods are sold by the demi-kilo of 500 grams, otherwise known as the livre or pound, and weighing 1½ lb. avoirdupois. The metrical ton, or tonneau, consists of 1000 kilograms, or 2205 lb., against the English ton of 2240 lb. The measure of capacity is the litre, 1½ pints.

## GERMAN EMPIRE.

Imports.	1901.	1900.	1899.
	1,000 Marks.	1,000 Marks.	1,000 Marks.
Articles of Consumption.....	1,710,249	1,584,429	1,541,984
Textiles.....	1,139,603	1,273,311	1,273,185
Metals and Metal Ware.....	640,232	768,216	713,027
Fats and Oils.....	344,326	359,958	306,240
Wooden Wares.....	270,725	337,275	384,657
Chemicals, Drugs, &c.....	331,593	331,365	316,265
Leather, &c.....	272,935	281,544	251,125
Fuel.....	182,742	222,157	160,679
Animal Products.....	216,501	211,063	191,166
Machinery, Instruments, &c.....	95,861	138,313	...
Exports.	1901.	1900.	1899.
	1,000 Marks.	1,000 Marks.	1,000 Marks.
Textiles.....	1,051,092	1,098,750	1,034,616
Metals and Metal Wares.....	739,949	783,282	745,517
Articles of Consumption.....	433,019	496,467	459,079
Chemicals, Drugs, &c.....	408,366	397,617	409,869
Machinery, Instruments, &c.....	...	344,294	...
Fuel.....	275,080	286,216	235,861
Leather, &c.....	266,407	266,298	270,817
Stone, Clay, and Glass.....	190,745	201,635	169,560
Wooden Wares.....	157,502	169,582	148,612

*Weights and Measures and Coinage.*—Metric weights and measures are used. The monetary unit is the mark, which is equal to our shilling. It is divided into a hundred parts or pfennigs.

## GREECE.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Gold Drachmai.	1,000 Gold Drachmai.		1,000 Gold Drachmai.	1,000 Gold Drachmai.
Cereals.....	35,358	33,595	Currants.....	41,191	52,891
Woven Stuffs and Yarn.....	19,524	16,485	Ores.....	19,166	20,811
Coal and other Minerals.....	18,373	14,952	Wines.....	1,889	4,813
Wood and Timber.....	8,814	11,143	Tobacco.....	4,114	3,565
Fish, Caviar, &c. ....	5,642	6,166	Figs.....	3,151	2,430
Ores and Metals.....	7,650	5,644	Olive Oil.....	4,620	2,344
Chemicals.....	4,558	4,164	Gall-Nuts.....	2,116	1,619
Raw Hides.....	3,717	3,389	Silk and Co- coons.....	1,817	1,418

*Money.*—1 drachma=1 franc. (See France.)

*Weights and Measures.*—Metric is replacing old.

## ITALY.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Lire.	1,000 Lire.		1,000 Lire.	1,000 Lire.
Coal.....	150,009	207,782	Silk, raw and thrown .....	395,472	349,061
Cotton, raw....	158,093	150,908	Silk, waste.....	33,491	31,632
Grain, Wheat.	198,130	143,118	Silk Cocoons..	2,402	1,432
Machinery.....	72,608	89,318	Wine (incasks)	37,029	57,378
Silk, raw, un- bleached, or twisted.....	83,833	74,405	Eggs.....	47,920	50,035
Timber for building.....	56,538	54,578	Sulphur.....	41,201	47,435
Hides, raw and dried.....	38,638	43,209	Hemp and Flax, raw....	34,612	43,938
Wool, raw.....	45,980	42,822	Olive Oil.....	45,685	31,936
Fish of all sorts	34,736	30,522	Coral.....	22,909	22,410

*Money.*—1 lira=1 franc. (See France.)

*Weights and Measures.*—Metric.

## JAPAN.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Yen.	1,000 Yen.		1,000 Yen.	1,000 Yen.
Cotton and Seed.....	60,650	59,472	Silk, raw.....	79,136	48,818
Iron and Steel Manufactures	19,971	31,665	Silk and Manufactures.....	30,001	23,512
Sugar.....	33,530	26,692	Cotton Yarn...	21,466	20,589
Cotton Manufactures.....	14,145	25,699	Coal.....	17,542	20,032
Wool and Manufactures	11,837	23,474	Copper.....	13,905	12,864
Petroleum.....	14,943	14,163	Tea.. ..	8,854	9,036
Arms, Machines, &c....	16,604	13,767			

*Money, Weights, and Measures.*—The monetary unit is the yen, worth about 2s. 0½d., and divided into 100 sen. The metric weights and measures are legal. The native weights are the kwan, a little over 8½ lb., and the kin, about 1½ lb. The kin of 6 shaku measures nearly two yards, so that a shaku is practically one foot. A ri is nearly 2½ miles.

## KOREA.

Imports.	1900.	1899.	Exports.	1900.	1899.
	1,000 Yen.	1,000 Yen.		1,000 Yen.	1,000 Yen.
Cotton Goods.	5,526	5,385	Gold .....	3,633	...
Kerosene.....	560	592	Rice .....	3,626	1,418
Silk Piece Goods.....	507	422	Beans.....	2,369	1,975
Metals.....	362	261	Ginseng.....	1,548	380

*Money.*—Copper cash as in China. A silver dollar is minted. The Japanese yen is commonly used.



## MEXICO.

Exports.	1901-1902.	1900-1901.
	1,000 Silver Dol.	1,000 Silver Dol.
Minerals.....	88,405	97,912
Vegetable Substances.....	51,946	36,149
Animals.....	11,874	11,538
Manufactured Products .....	3,471	2,395

*Money.*—1 silver peso or dollar = nominally 4s., actually about 2s.

*Weights and Measures.*—Metric.

## NETHERLANDS.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Guilders.	1,000 Guilders.		1,000 Guilders.	1,000 Guilders.
Cereals and Flour.....	366,167	328,186	Cereals and Flour.....	215,880	191,957
Iron and Steel.	182,447	188,694	Iron and Steel.	128,796	142,586
Textiles, raw and manu- factured.....	135,174	122,814	Copper .....	70,651	88,292
Copper.....	74,309	85,486	Textiles.....	97,414	88,059
Wood.....	64,625	59,272	Sugar.....	60,939	53,786
Rice.....	54,927	48,106	Vegetables....	51,937	47,416
Coal.....	53,630	59,632	Margarine.....	47,088	44,705
Coffee.....	52,279	50,375	Paper.....	41,198	43,632
			Wood.....	45,749	39,575
			Coffee.....	32,741	33,214

*Money.*—1 guilder, guilder, or florin = 100 cents = 1s. 8d.

*Weights and Measures.*—Metric.

## NORWAY.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Kronor.	1,000 Kronor.		1,000 Kronor.	1,000 Kronor.
Bread-Stuffs.....	45,805	52,818	Wooden Goods and Timber.....	59,613	67,721
Minerals, unwrought.....	37,041	42,611	Animal Produce (malty food).....	53,413	54,424
Textile Manufactures.....	24,803	24,989	Paper and Paper Manufactures....	9,875	8,747
Groceries.....	24,980	24,635	Vessels, Carriages, Machinery, &c...	4,181	7,304
Vessels, Carriages, Machinery.....	23,819	30,534	Hair, Skins, &c...	6,095	5,610
Metals, manufactured.....	22,566	23,017	Tallow, Oils, Tar, Minerals, unwrought.....	6,593	5,445
Tallow, Oils, Tar, &c.....	19,046	18,405		3,806	3,951
Yarn, Rope, &c....	16,782	15,626			
Metals, unwrought or partly wrought	11,239	13,634			
Wooden Goods and Timber.....	9,206	11,788			

*Money.*—1 Norse krone=1 Swedish krona=100 öre=1s. 1½d.

*Weights and Measures.*—Metric.

## PERSIA.

No satisfactory figures.

*Money.*—1 kran=1000 dinars (in which accounts are kept)=formerly 1 franc, now less than 5d.

## PERU.

Imports.	1900.	1889.	Exports.	1900.	1889.
	1,000 Soles.	1,000 Soles.		1,000 Soles.	1,000 Soles.
Small Wares, &c. ....	11,768	7,989	Ores.....	16,951	10,667
Cottons.....	3,613	3,770	Sugar.....	14,558	10,104
Provisions.....	2,529	2,381	Cotton.....	3,261	1,787
Furniture, &c.	1,692	1,324	Wool.....	2,967	3,118
Woollens.....	1,478	1,451	Cocaine.....	1,162	675
Other Tissues.	665	...	Hides.....	1,086	783

*Money.*—1 gold libra=10 soles=£1.

*Weights and Measures.*—Metric legal, and used for Customs returns. Old Spanish weights and measures common. 1 quintal=100 libra=107·4 lb. 1 arroba=25·4 lb.=6·7 gallons. 1 vara=·93 yard,

## PORTUGAL.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Mil.	1,000 Mil.		1,000 Mil.	1,000 Mil.
Coal.....	5,096	5,547	Wine .....	9,394	10,629
Wheat .....	3,145	4,973	Cork .....	3,276	2,464
Cotton, Cottons, and			Cottons .....	657	2,136
Yarn .....	6,908	...	Sardines.....	1,154	1,228
Codfish.....	3,449	2,821	Copper Ore ....	1,234	1,093
Iron .....	1,505	2,602			
Sugar .....	2,308	2,244			

*Money.*—1 gold milreis=1000 reis=4s. 5d. ; 1 conto=1000 milreis=£222, 4s. 5d.

*Weights and Measures.*—Metric. Old still partly in use.

## ROMANIA.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Lei.	1,000 Lei.		1,000 Lei.	1,000 Lei.
Textiles.....	141,900	73,963	Cereals.....	245,800	172,727
Metals and			Fruits.....	...	47,059
Manufactures	47,800	53,162	Wood.....	18,000	12,322
Colonial Produce.....	15,800	14,252	Mineral Fuel..	6,000	10,448
Chemicals.....	22,000	10,464	Chemicals.....	24,900	9,548
Cereals.....	4,600	7,078	Animals and their Products.....	15,600	7,203
Hides, Leather, &c. ....	13,300	6,396			
Oil, Wax, &c..	8,000	5,606			
Mineral Fuel..	...	4,637			
Paper.....	5,100	4,583			

*Money.*—1 lei=1 franc. (See France.)

*Weights and Measures.*—Metric. Turkish still partially used.

## RUSSIA.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Roubles.	1,000 Roubles.		1,000 Roubles.	1,000 Roubles.
Machinery .....	56,703	76,665	Cereals and		
Raw Cotton .....	57,231	63,201	Flour .....	344,158	304,698
Coal and Coke..	21,355	42,589	Timber and		
Raw Metals .....	30,307	36,673	Wooden Goods	56,910	58,384
Metal Goods....	28,840	29,022	Flax.....	49,912	49,068
Tea.....	29,190	23,639	Naphtha and		
Wool, raw, and			Naphtha Oils.	52,289	45,973
Yarn.....	33,747	21,759	Oleaginous and		
Gum and Resin.	18,918	21,178	other Grains...	16,653	37,945
			Eggs .....	35,544	31,583
			Sugar.....	7,338	16,330
			Oil-Cakes.....	16,743	15,540
			Dairy Produce..	27,008	14,040

*Money.*—1 gold ruble=100 kopeks=2s. 1'6d. Usually 9'37 rubles=£1.

*Weights and Measures.*—1 pood=40 lb.=36 lb. avoirdupois; 63 poods=1 ton; 1 chetvert=5'77 bushels= $\frac{7}{8}$  imperial quarter. 1 verst= $\frac{2}{3}$  of a mile; 1 sayene=3 arshins=7 feet; 1 dessyaline=2 $\frac{1}{2}$  acres.

In Finland: *Money*—1 markka=100 penni=1 franc. *Weights and Measures.*—Metric.

## SERVIA.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Dinars.	1,000 Dinars.		1,000 Dinars.	1,000 Dinars.
Machinery .....	2,617	7,457	Agricultural		
Chemicals.....	2,096	6,961	Produce and		
Metals .....	4,192	6,667	Fruits.....	25,195	30,148
Cotton Goods,			Animals and		
&c. ....	7,627	6,471	Animal Pro-		
Wool and Wool-			duce.....	30,954	27,086
len Goods .....	3,688	3,942	Foods and		
Hides, Skins,			Drinks.....	2,938	3,207
Leather.....	4,064	3,830	Hides, Skins,		
Colonial Pro-			Leather .....	3,088	3,061
duce.....	2,437	3,120			
Apparel.....	3,006	2,969			

*Money.*—1 Servian dinar=1 franc. (See France.)

*Weights and Measures.*—Metric.

## SIAM.

Imports.	1901.	1900.	1899.	Exports.	1901.	1900.	1899.
	£1,000.	£1,000.	£1,000.		£1,000.	£1,000.	£1,000.
Cotton Goods	539	409	229	Rice .....	3,484	2,225	2,224
Treasure .....	292	336	683	Teak .....	241	325	324
Steel, Iron,				Marine Pro-			
Machinery..	246	...	...	ducts .....	159	122	131
Opium .....	125	141	104	Bullocks .....	49	49	57
Silks .....	114	128	95	Pepper .....	83	47	66
Sugar .....	84	102	49				
Kerosene .....	64	98	61				
Gunny Bags.	136	91	72				

*Money.*—1 tical =  $\frac{2}{3}$  Mexican dollar = 60 cents.

*Weights and Measures.*—1 hap = 50 chang = 133 $\frac{1}{2}$  lb.

## SPAIN.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Pes.	1,000 Pes.		1,000 Pes.	1,000 Pes.
Alimentary			Alimentary		
Substances, in-			Substances....	233,476	264,628
cluding Grain,			Stone, Mineral,		
Sugar, Corn,			als, Glassware,		
&c. ....	136,223	139,239	Pottery .....	150,299	159,124
Machinery, Ve-			Metals and		
hicles, Vessels	97,554	135,198	Manufactures.	98,912	101,422
Stone, Minerals,			Animals and		
Glassware, and			their Products	61,478	65,498
Pottery .....	112,687	106,480	Timber and		
Cotton and			Manufactures.	47,715	60,658
Manufactures.	108,225	94,211	Cotton and		
Drugs and			Manufactures.	29,001	34,057
Chemical Pro-			Drugs and		
ducts .....	79,997	76,340	Chemical Pro-		
Animals and			duce .....	20,652	20,155
their Products	70,868	82,320			
Timber and					
Manufactures.	61,717	60,847			
Metals and					
Manufactures.	34,952	45,850			

*Money.*—1 peseta = 100 centesimos = 1 franc = 9 $\frac{1}{2}$ d. nominally, but only 7 $\frac{1}{2}$ d. actually.

*Weights and Measures.*—Metric. The old system still lingers. 1 quintal = 100 libra = 101 $\frac{1}{4}$  lb. 1 arroba of wine = 3 $\frac{1}{2}$  gallons of oil = 2 $\frac{3}{4}$  gallons.

## SWEDEN.

Imports.	1900.	1899.	Exports.	1900.	1899.
	1,000 Kronor.	1,000 Kronor.		1,000 Kronor.	1,000 Kronor.
Minerals, mostly Coal.....	104,052	82,388	Timber, wrought and unwrought	200,559	178,554
Metal Goods, Machinery, &c.	65,010	74,605	Live Animals and Animal		
Corn and Flour..	51,793	49,328	Food.....	43,162	48,129
Raw Textiles and Yarn.....	46,166	47,818	Metals, raw or partly wrought	52,395	43,513
Textiles.....	41,959	46,738	Metal Goods, Machinery, &c.	25,317	22,585
Colonial Wares.	45,584	38,635	Paper and Paper Manufactures..	14,392	11,707
Hair, Hides, &c.	20,439	24,459			
Live Animals and Animal Food.....	29,196	23,542			

*Money.*—1 Norse krone=1 Swedish krona=100 öre=1s. 1½d.

*Weights and Measures.*—Metric.

## SWITZERLAND.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Francs.	1,000 Francs.		1,000 Francs.	1,000 Francs.
Food-Stuffs, To- bacco, Spirits..	276,735	272,833	Silk .....	232,149	224,510
Silk .....	145,073	145,155	Cottons .....	150,961	167,615
Useful Metals...	77,036	104,574	Clocks and Watches.....	130,769	122,823
Mineral Sub- stances .....	85,369	93,028	Food-Stuffs, To- bacco, Spirits .	107,602	104,029
Cottons .....	65,274	80,369	Machinery, Car- riages .....	47,144	49,511
Wools .....	49,511	55,856	Wools .....	17,743	18,768
Animals .....	45,043	43,508	Colours.....	15,272	15,915
Machinery, Car- riages .....	26,323	36,785	Drugs, Chemi- cals, &c.....	13,203	13,044

*Money, Weights, and Measures.*—As in France.

## TURKEY.

Imports.	1897-1898.	1896-1897.	Exports.	1897-1898.	1896-1897.
	1,000 Piastres.	1,000 Piastres.		1,000 Piastres.	1,000 Piastres.
Linens .....	217,694	165,845	Grapes .....	181	193,624
Quilting .....	174,301	135,521	Silk .....	130,750	145,817
Sugar .....	160,843	160,592	Mohair .....	92,491	51,280
Cotton Yarn .....	110,393	90,029	Bones .....	74,328	...
Coffee .....	93,572	87,837	Valonia .....	66,303	55,728
Rice .....	90,863	73,443	Cocoons .....	65,061	69,483
Woollen Goods..	79,706	56,315	Wheat .....	61,236	86,248
Petroleum .....	72,611	87,202	Opium .....	55,079	78,505

*Money.*—1 purse of 500 Mejidiye piastres=5 Turkish lira=£4, 10s. (when gold) ; 1 piastre=2½d.

*Weights and Measures.*—Metric under old names.

## UNITED STATES.

Imports.	1901-1902.	1900-1901.	Exports.	1901-1902.	1900-1901.
	1,000 Dollars.	1,000 Dollars.		1,000 Dollars.	1,000 Dollars.
Sugar.....	55,061	90,488	Raw Cotton ...	290,652	313,673
Coffee.....	70,982	62,861	Bread-Stuffs...	213,134	275,595
Chemicals, Drugs, and Dyes.....	57,724	53,508	Provisions, Meat, and Dairy Pro- duce.....	199,861	196,960
Hides and Skins.....	58,011	48,224	Iron, Steel, and Manufactures	98,552	117,319
Cotton, manu- factures of...	44,460	40,247	Mineral Oils...	72,303	71,113
Fibres, Vege- table and Tex- tile Grasses, manufactures of.....	39,036	32,763	Wood and Manufactures	47,780	52,446
Do., unmanu- factured.....	31,546	...	Animals.....	44,872	52,059
Silk, unmanu- factured.....	42,635	30,051	Copper and Manufactures	43,820	44,614
India-rubber and Gutta- percha, crude	25,653	28,835	Tobacco and Manufactures	32,773	32,749
Silk, manufac- tures of.....	32,640	26,842	Leather and Manufactures	29,798	27,924
Diamonds and other precious stones.....	23,348	20,426	Coal.....	20,765	22,317
Tin.....	19,462	19,806	Cotton, manu- factures of....	32,108	20,272
Wood and manufactures of.....	24,446	19,754	Vegetable Oils	15,309	19,036
Iron and Steel, manufactures of.....	27,180	17,875	Oil-Cake and Oil-Cake Meal	19,943	18,592
Fruit.....	21,481	19,587	Agricultural Implements..	16,287	16,313
Tobacco.....	17,706	18,771			

*Money.*—1 gold dollar=100 cents=4s. 1½d.

*Weights and Measures.*—As British, except 1 cental=100 lb.; 1 short ton=2000 lb.; 1 long ton=British ton (2240 lb.). Old Winchester gallon used; bushel=0·97 imperial bushel.



## URUGUAY.

Imports.	1901.	1900.	Exports.	1901.	1900.
	1,000 Dollars.	1,000 Dollars.		1,000 Dollars.	1,000 Dollars.
Foods and Drinks.	7,418	7,321	Hides and Skins...	8,440	8,183
Raw Materials and			Wool.....	8,662	8,025
Machinery .....	7,743	7,254	Jerked Beef .....	4,893	6,042
Textiles.....	3,775	4,106	Tallow.....	1,530	1,662
Apparel and Haber-			Extract of Beef....	1,221	1,319
dashery .....	1,115	1,302			
Tobacco.....	232	210			

*Money.*—1 peso or dollar = 4s. 2d.

*Weights and Measures.*—Metric and old Spanish.

## VENEZUELA.

No figures.

*Money.*—1 bolivar = about 1 franc nominally; 1 dollar = 5 bolivars. In accounts the peso = 4 bolivars, may be used.

*Weights and Measures.*—Metric legal. Old Spanish common.

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